A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG THE LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE.

By

Reg. No: 301515902

A Dissertation submitted to The Tamil Nadu Dr. M.G.R Medical University, Chennai, in partial fulfillment of requirement for the Degree of

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

CERTIFICATE

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Psalms 115:1

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CHAPTER – I

INTRODUCTION

"Children are a gift from the Lord; they are a reward from him"

- Psalm 127 : 3

Human Birth is the most miraculous, transformational and mysterious event of life. It is also an experience that is shared by every single member of the human race. The birth experience indelibly imprints itself in the lives of both the mother who is giving birth and the baby who is being born **(Barbara Harper, 2005).**

Newborns are the most vulnerable group in getting adjusted to the new environment. Following the birth, the first few months will act as a transition period during which the baby adjusts from the aquatic to the aerial environment. Hence care method that facilitates better adaptation of neonates with early post – natal environment has an important role in the growth of newborns. As a result, the way in which baby has been positioned throughout this time is very important **(Oyen N, Markestaad T 2011).**

Birth weight is one of the significant predictors of child's mental development, future physical growth and survival. It is an important risk factor for child's morbidity and mortality. According to the WHO, low birth weight is defined as an infant birth weight of less than 2,500 grams. This group of children is considered to have higher risk of neonatal, post-neonatal death and morbidity **(Daynia EB, Tobias FC, Peter AC, 2010).**

Low Birth Weight babies have higher morbidity and mortality. A baby's LBW is due to Preterm birth or due to IUGR or both. IUGR may present in both term and preterm infants. They have loose skinfolds, absence of subcutaneous fat and peeling of skin. LBW is a global and alarming problem and their major problem is inability to control body temperature **(OP Ghai, 2012).** LBW can affect nearly every organ in the body. Some LBW babies need special care in the hospital after birth. They may need help with breathing, staying warm, protection against infection and getting enough nutrition. They may have problems with their lungs, intestinal tract, vision and hearing and also developmental delays in future **(Carlo WA, Nelson 2011).**

Low birth weight infants are more prone to **Hypothermia** because they have higher body surface area to weight, thereby exposing more skin surface to the environment. They have lesser amount of subcutaneous fat, thereby losing the insulating power of the fat and decreased brown adipose tissue, a major energy store for maintaining body temperature by non – shivering thermogenesis. They also have hypotonic **'frog like posture'** which increase the exposed area to the environment. These babies, once become hypothermic, are very difficult to manage. Hence, prevention is the key to minimize newborn mortality and morbidity and the important preventive measure in newborn care is maintaining the temperature in the thermo-neutral range **(Swarna Rekha, 2009).**

The **Physiological changes** during stress and discomfort are hypoxemia, increased respiratory rate, heart rate and blood pressure. Due to poor or **in-coordinated sucking and swallowing**, there are difficulties in self-feeding. LBW babies should be provided with in-utero milieu. Uterus provides ideal ambient conditions to the baby. All attempts should be made to create uterus-like baby friendly ecology in the nursery. A soft, comfortable, **"Nestled"** and cushion bed should be created **(Meharban Singh, 2016).**

Positioning and handling techniques promote comfort and minimize stress, while creating a balance between nurturing care and necessary interventions. Using the developmental model of supportive care, the nurse closely monitors physiologic and behavioral signs to promote organization and well-being of high risk infants during handling. Gently holding the infant's arms and legs in a tucked, flexed position close to the body can be accomplished with hands or blanket swaddling. Facilitated tucking, blanket swaddling and **Nesting** were shown to decrease physiologic and behavioural distress during routine care **(Hockenberry Wilson, 2015).**

"Nesting" is a comfortable measure that stimulates in-utero feeling of lack of space and makes the baby less prone to startle. The infant can be positioned prone or on the side with flexed extremities by providing a 'nest' with a rolled blanket. The upper part of the baby's body is slightly raised, resembling a position as he is "cradled in the arm" **(Gibbons S, 2003).**

NEED FOR THE STUDY

Globally there are **139 million** live birth and more than 20 million are low birth weight. The number of LBW babies are concentrated in two areas of the world namely Asia and Africa. In Asia, 72% of the newborn babies are being born with LBW and among those, 40% belong to India.

According to WHO data, in May 2014 LBW babies mortality in India reached **3,80,890** (4.29 % of total deaths). Globally, India is in the **16th** place with the death rate of LBW baby. Nearly 20% of all babies born in India have a birth weight of less than 2.5 Kg and this is more prevalent in urban areas than rural villages **(Indian Health News).**

Low Birth Weight infant is one who weighs less than 2500 grams at birth. Every year 20 million LBW infants are born in the developing countries and 40% of these are born in India. LBW infants are a heterogeneous group of babies which include both preterm as well as full term infants those who weigh less than 2500 grams **(Pankaj Gang, Vivek Chouduary, 2012).** As per the census of 2001 and 2011, the incidence of LBW was highest among babies with mothers born in Pakistan, India and Bangladesh **(Janet M. Rennie, 2012).**

India is a vast country, over 74% of the population lives in rural areas. Inevitably, there is wide disparity among various population groups, with the rural NMR almost double that of the urban areas. The current NMR is 39 and contributes to two-thirds of infant deaths. India's share of the global burden of neonatal deaths is the largest of any country, accounting for 1.2 to 5 million newborn deaths annually. The major cause of neonatal mortality are sepsis, birth asphyxia, prematurity and LBW. In India, over one-third of all neonates are of LBW. An important reason for the high neonatal mortality is lack of care at birth. The challenge in the newborn care is to identify the cost-effective interventions to address newborn problems currently lacking a ready solution **(Swarna Rekha, 2009).**

An exploratory descriptive study was carried out in USA, to explore the physiological and behavioural stress in preterm and LBW infants. By using convenience sampling technique, 42 infants were included in the study. The data collection was done in the neonatal intensive care unit. At every 10 minutes

observation, heart rate and oxygen saturation levels were recorded for 5 seconds at regular intervals and observational measures of behavioural distress and motor activity were recorded twice a minute. The result shows that the stress cues were more often related to decreased levels of oxygen saturation and increased heart rate. The researcher suggested that neonatal nurses should monitor activity cues in response to care giving and minimize stimuli that evoke stress responses linked to physiological instability **(Lynda Law Horrison., et al, 2004).**

A descriptive longitudinal prospective study was conducted at a medical college hospital, Bhubaneshwar, India. The study was carried out for a period of two months in NICU. By using purposive sampling technique, 50 LBW babies were selected. A self-designed observation checklist was prepared on clinical profile and morbidity pattern among the LBW babies to rule out any associated factors lies in mother. The data was collected through records, observation and from the staff working in NICU. The physical features with mean score of 16 ± 0.30 that reveals very poor presentation of physical, physiological and neurobehavioral maturity. The result shows that the major features of LBW babies were wide suture, soft skull bones, absence of buccal fat, non-flexed posture, poor reflexes and respiratory distress. The researcher concludes that the current study shows a vivid picture of LBW babies where they are everyway under developed. So the nurses must provide an environment which is safe, adopted to their physiological needs and promotes nursing services to enhance their rate of survival **(Pravati Tripathy, 2014).**

Several article reviews reveals that newborn care including positioning and maintaining posture is an important aspect and it can play a major role in the development of newborn babies. Since the incidence of physiological instability, distress and developmental problems related to improper maintenance of posture is increased, the researcher felt that it is the responsibility of nurses to maintain the posture as much as possible to provide maximum comfort to the baby in order to stabilize the bio – physiological parameters such as temperature, heart rate, respiratory rate and oxygen saturation and also to improve the sucking response of LBW babies.

STATEMENT OF THE PROBLEM

A Study To Assess The Effectiveness Of Nesting On Bio – Physiological Parameters And Sucking Response Among The Low Birth Weight Babies In Selected Hospitals, Coimbatore.

OBJECTIVES

- To assess the bio – physiological parameters and sucking response among the low birth weight babies.
- To assess the effectiveness of Nesting on the bio – physiological parameters and sucking response among the low birth weight babies in the experimental group.
- To compare the bio – physiological parameters and sucking response among the low birth weight babies between experimental and control group.
- To associate the findings with the selected demographic variables.

OPERATIONAL DEFINITIONS

- **Effectiveness:** It refers to the capability of nesting that improves the bio – physiological parameters and sucking response among the LBW babies.
- **Nesting:** It is an intervention which gives comfortable flexed position to the LBW baby by providing a shell – shaped boundary using a rolled cotton.
- **Bio – Physiological Parameters:** It Includes Temperature, Heart Rate, Respiratory Rate and Oxygen Saturation which are assessed by using Digital thermometer, Pulse oximeter and manual count of respiration respectively.
- **Sucking Response:** Baby instinctively sucks on the nipple that touches the roof of their mouth or lips that is assessed using Modified Early Feeding Skills Assessment Scale.
- **Low Birth Weight Babies:** Babies born with birth weight between 1500 grams and 2500 grams in the selected hospitals.

ASSUMPTIONS

- Majority of the LBW babies have unstable bio – physiological parameters due to discomfort with the surroundings in their earlier days of life.
- Most of the LBW babies have poor sucking response in their earlier days of life.
- Nesting will provide a comfortable flexed position that will stabilize the bio – physiological parameters and improve the sucking response.

HYPOTHESIS

Low birth weight babies who receive nesting will show significant improvement in bio – physiological parameters and sucking response than the low birth weight babies who do not receive nesting.

DELIMITATIONS

The study is limited to :

- The babies who are born with birth weight between 1500 grams and 2500 grams.
- The babies who are born from 34 weeks to 37 weeks of gestation.
- The babies whose age is less than 7 days.
- The babies who are normal at birth with no severe complications.
- The babies whose parents are permitting to provide nesting for the babies.

PROJECTED OUTCOMES

The findings of the study will help the newborn to stabilize their bio – physiological parameters and improve their sucking response and also help the caregivers to have a positive attitude towards nesting and gain skills in providing nesting.

CONCEPTUAL FRAMEWORK

Concept is the symbolic statements describing a phenomenon or a class of phenomena. Framework is described as the map for a study which gives a rationale for the development of research questions or hypotheses.

Conceptual framework deals with abstraction concepts that are assembled by virtue of their relevance to a common theme. It serves as a spring board for the generation of hypotheses to be tested **(BT Basavanthappa, 2007).**

The conceptual framework used in this study is based on modified Levine's Conservation Model of Nursing, 1973. It is based on the goal of promoting adaptation and maintaining wholeness using the principles of conservation.

According to this model, nursing interventions are provided in order to improve the patient's condition or to promote comfort. The key concept of the model is, when a person is in a state of conservation, it means that individual adaptive responses conform changes productively and to the least expenditure of effort, while preserving optimal function. The model delineates the concept of conservation which means "Keeping together", using four conservation principles. The model defines the individual's wholeness thereby maximizing nursing acts that are used to conserve the individual's wholeness.

The present study aims at developing and evaluating the effectiveness of the nesting on bio – physiological parameters and sucking response among the LBW babies.

The researcher adopted Levine's conservation model of nursing as a basis for conceptual framework which is aimed to stabilize bio – physiological parameters and improve sucking response through Nesting.

ENVIRONMENT

The environment completes the wholeness of the individual. Patient cannot be separated from the environment. A person is seen as an open system which communicates and reacts to its environment. An individual's reaction with the

environment is essential to adaptation and survival. The individual has both internal and external environment.

Here, the researcher considers environment as an immediate major challenge to the LBW babies as there is a sudden change from intrauterine to extrauterine environment. There is a less potential to adapt to the external environment due to low birth weight and lack of appropriate growth.

EXTERNAL ENVIRONMENT

It includes those factors that disturb and challenge the individual. Here, the researcher considers the external environment for the LBW babies such as temperature, noise, surrounding equipments and articles around the baby, frequent handling of the baby and various nursing care procedures.

INTERNAL ENVIRONMENT

It combines the physiological and pathological aspects of the individual and is constantly challenged by the external environment. Here, the researcher considers the internal environment for LBW babies are such as physiological discomfort, bio – physiological instability, poor muscle mass and neurological immaturity.

WHOLENESS

Holism is the central concept in Levine's theory. Wholeness is the state in which the internal environment and the external environment have the best-fit. Wholeness exists when there is an interaction or constant adaptation to the environment. Here, the researcher considers the wholeness as the constant adaptation between the internal and the external environment of the LBW babies and able to maintain thermal stability, physiological stability and improved sucking response.

DISRUPTION OF WHOLENESS

A disruption at the interface between the internal and the external environment poses an environmental challenge and create a disruption in health. Here, the researcher observes that there is a disruption of wholeness in the LBW babies of both

experimental and control group are in the aspects of thermal energy imbalance, physiological instability and poor sucking response.

ADAPTATION

Adaptation is the process by which individuals fit the environment in which they live. It is achieved through the controlled use of environmental resources by the individual. Individuals seek nursing care when they are no longer able to adapt. The goal of nursing care is to promote adaptation and maintain wholeness. This goal is accomplished through conservation principles.

Here, the researcher believes that the LBW babies face difficulties in adapting to the external environment. The nursing care intervention (Nesting) will help the LBW babies in experimental group to adapt to the environment in order to maintain wholeness.

CONSERVATION OF WHOLENESS

The primary focus of conservation is keeping together of the wholeness in the individual. It describes the way in which the complex systems are able to continue to function even in the face of several challenges. Through conservation, individual are able to confront obstacles, adapt accordingly and maintain their uniqueness. Levine has proposed four conservation principles of nursing to the individual and the environment of the patient. They are conservation of energy, conservation of structural integrity, conservation of personal integrity and conservation of social integrity.

Here, the researcher aims at the optimum conservation of the wholeness of the LBW babies in the experimental group by following the conservation principles of nursing proposed by Levine. The researcher considers two of the conservation principles (conservation of energy and conservation of structural integrity) among those four principles for the LBW babies in this study.

The conservation of energy is the basic universal law of conservation. Levine states that energy is identifiable, measurable and manageable. It is the balance between the productive and expenditure of energy. The nursing intervention should

assist the patient to maintain energy balance. Here, the researcher considers the thermal energy conservation. The LBW babies in both experimental and control group have an imbalance between the heat produced and heat lost due to small body surface area and large external surface area. The nursing intervention (Nesting) is given to the experimental group babies to achieve the thermal energy conservation.

The structural integrity is the proper balance between structure and function. Conservation of structural integrity depends on the defence system that supports repair and healing in response to challenges from internal and external environment. Here, the researcher concentrates on the positional discomfort that causes physiological instability and poor sucking response due to neurological immaturity. The LBW babies have reduced muscle mass and hypotonia which causes positional discomfort. The nursing intervention (Nesting) is given to the experimental group babies which helps to maintain a flexed position. This helps the baby to maintain proper body posture that improves the physiological stability and sucking response.

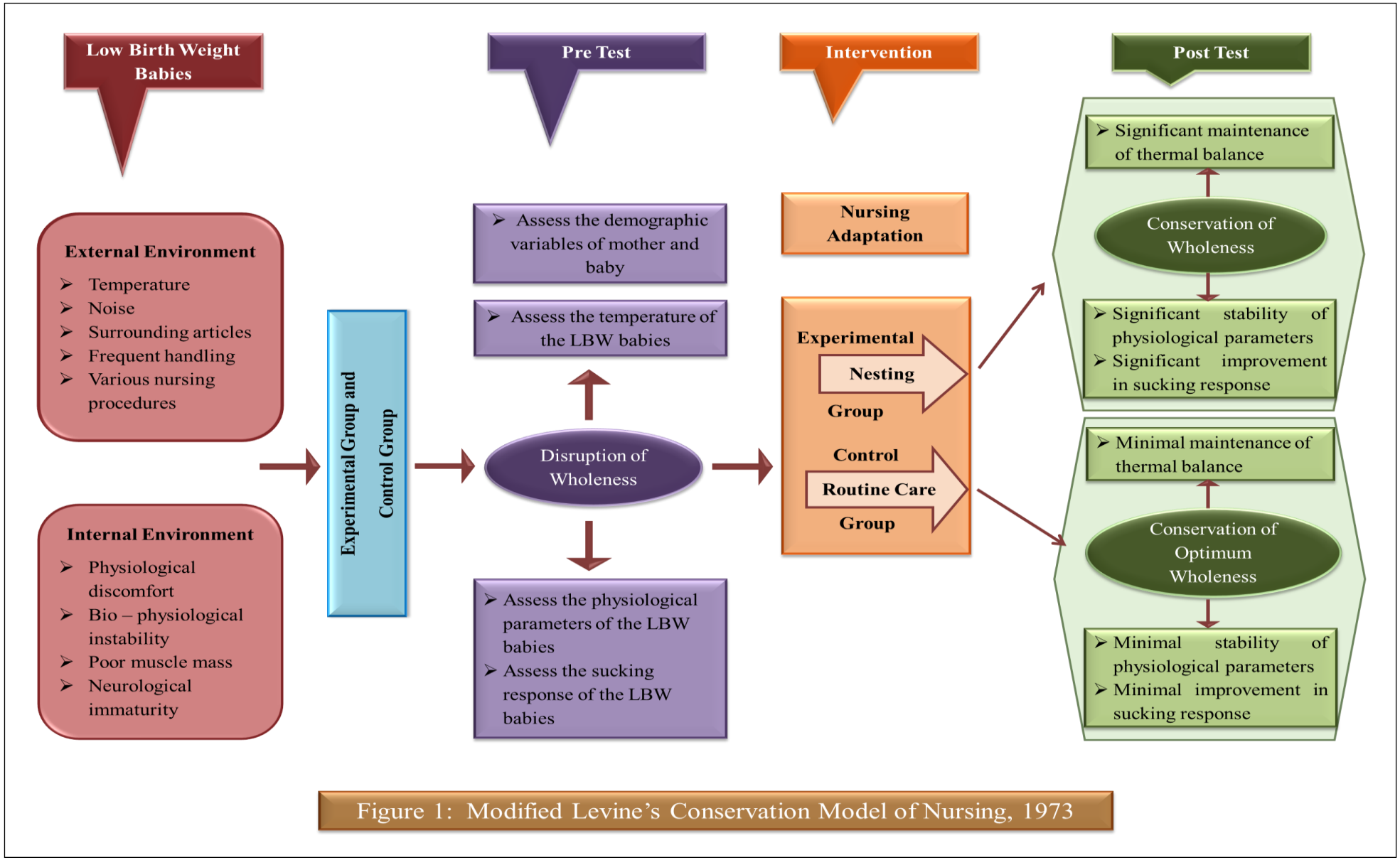

Figure 1: Modified Levine's Conservation Model of Nursing, 1973

CHAPTER – II

REVIEW OF LITERATURE

Review of literature is a key step in research process. It refers to an extensive and systematic examination of publication relevant to the research topic. It is the activity involved in identifying and searching for information on a topic and developing and understanding the state of knowledge on the topic.

Literature review is a broad, comprehensive in depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, audio visual materials and personal communications **(BT Basavanthappa, 2010).**

The Review of literature for the present study was collected from various information given in books, journals, abstracts, published and unpublished dissertations, census and internet websites. For a better understanding, the review of literature has been organized as follows:

SECTION A: Theoretical overview regarding the problems of the low birth weight babies.
SECTION B: Studies related to the low birth weight babies.
SECTION C: Studies related to the effectiveness of nesting for the low birth weight babies.

SECTION A: Theoretical overview regarding the problems of the Low Birth Weight Babies.

Low birth weight babies are small in size with thin, gelatinous, shining and pink skin. They have poor muscle tone with sluggish automatic reflexes and slow or ineffective sucking and swallowing efforts. Besides the pathologies that can affect all neonates irrespective of weight and gestation, additional complications occur in low birth weight baby who require special care and management **(OP Ghai, 2012).**

Low birth weight infant is a phrase used to describe all infants weighing less than 2500 grams. LBW may be caused by preterm delivery or poor fetal growth. The characteristics of these infants are generalized lack of subcutaneous tissue results in prominence of the body skeleton with a thin, lined face, loose skin over limbs. They

have muscular hypotonicity results in the characteristic posture in which the limbs are widely abducted, knees and ankles flexed, head rolling to one side. The ability to suck and to co – ordinate sucking and swallowing is poorly developed. The heart rate averages 140 beats per minute. The respiratory rate is 40 – 50 breaths per minute in first 24 hours thereafter decreasing to 35 – 45 breaths per minute. They have high surface area to body weight ratios and little brown adipose tissue and this makes difficult for them to maintain their temperatures **(Krishna M Goel, Devendra K Gupta, 2009).**

The functional immaturity of various systems in the LBW babies result in different clinical problems. The LBW infant is particularly at increased risk of hypothermia because of larger surface area to weight, increased trans-epidermal water loss, increased exposed area, thin and immature skin, increased cutaneous blood flow, decreased energy stores, less brown fat, limitations of oxygen conception because of pulmonary problems and increased respiratory rate. Hypothermia is invariable and life threatening unless environmental temperature is monitored. Due to poor or in-coordinated sucking and swallowing, there are difficulties in self-feeding **(Meharban Singh, 2016).**

The LBW babies with gestation age between 34 weeks and 37 weeks have a less coordination between sucking, swallowing and breathing than those of normal newborn babies since the muscles are still developing along with muscular and neurological development. They also lack proper posture and hold extremities in a frog like position due to poor muscle tone **(Jodi RN, 2013).**

The unusual sounds in nurseries, bright lights, frequent handling and painful procedures are the abnormal stimuli. The stressful behaviours are tachypnea, decreased oxygen and colour changes, tremors and flaccidity. Such behaviours should alert a caregiver that the environment has become too stimulating and needs to be modified. Activities such as turning infant to the side, providing boundary to his body with rolled towels, offering non-nutritive sucking and maintaining a quite environment are all the ways to reduce stimuli **(Adele Pillitteri, 1999).**

SECTION B: Studies related to the Low Birth Weight Babies.

A cross sectional study was carried out to estimate prevalence and to assess the factors contribute with LBW among neonates born in a district hospital, Kenya. A sample of 346 pregnant women were selected by using a simple random sampling method. Data was collected using a semi-structured interview tool and data abstraction form to collect reproductive and obstetric information from delivery records and child heath booklet. The study was conducted for a period of three months. The study shows that the prevalence of LBW baby is 12.3% and the LBW is largely influenced by maternal factors such as previous LBW or preterm delivery, maternal illness, nutritional status, maternal age and antenatal care **(Onesmus Maina, 2015).**

A prospective cross sectional study was done to identify the LBW prevalence and associated maternal risk factors of LBW babies in a tertiary level hospital, Ahmadabad. A sample of 4805 newborn babies was included in the study. The infants were weighed on an electronic metric scale. The informations from the mother and delivery records were collected and recorded in a prepared form. The study was conducted for a period of one year. The study shows that out of 4805 newborn babies, prevalence of LBW was 1355 (28.2%). Among those LBW babies, 64.2% were preterm and 35.8% were fullterm. It also shows that among these babies, 62.7% babies were weighted between 2000 grams to 2500 grams, 26.6% were weighed between 1500 grams to 2000 grams and 10.7% of them were less than 1500 grams. Prevalence of LBW babies were higher in mothers with extremes of age (below 20 years and above 35 years), low socio economic class, poorly educated mothers, primipara and grand multipara mothers, inadequate antenatal visits, previous preterm delivery with preterm and other risk factors. The study was concluded by indicating that these are the important maternal risk factors related to LBW babies **(Artipatel and Rushi patel, 2015).**

A case control study was done in kancheepuram district, Tamilnadu for a period of one year to find out the socio demographic and maternal factors related to LBW. Total sample of 208 cases and 208 controls of LBW babies and their mothers were collected by structured questionnaire. The study results shows that majority of cases (72.1%) belonged to 20 – 25 years of age group. Maximum mothers (47.6%)

were educated up to high school. Maximum participants were house wives (88.3%). There were 7.38% of mothers with inter pregnancy interval less than 2 years, 7.84% mothers had less than four antenatal visits, 4.5% of them are primi parity mothers and 5.04% mothers had anemia. The study concluded that the significant risk factors associated with LBW were poor socio economic status, maternal age less than 19 years, maternal malnutrition, less than four antenatal visits, inter pregnancy interval less than 2 years, primi parity and anemia **(Kanimozhy Kandhaswamy, Zile Singh, 2014).**

A quantitative explorative study was carried out to determine the prevalence of LBW and its risk factor among postnatal mothers. The study was conducted in the postnatal ward of selected hospital in Tamilnadu. Using purposive sampling technique, a sample of 60 postnatal mothers and their LBW neonates were selected. The tools used for the study includes checklist to categorize LBW baby and to assess the risk factors. The findings of the study shows that, regarding prevalence 48% were moderate LBW, 43% were VLBW and 9% were ELBW. There was a significant association between LBW and age of mother, educational status, income of the family, nutritional pattern, birth order of child and gestational weeks **(Rajalakshmi, et al., 2014).**

A secondary analysis exploratory study was conducted in NICU of intercity medical centres, Chicago. The main aim of the study is to determine the feeding skill progression among LBW preterm infants. A sample of 158 infants was selected using simple random sampling technique. Feeding skill progression was measured as the number of days taken by the infant to completely achieve 100% oral feeding. The infant characteristics and feeding skill progression data were obtained from medical records. The result shows that only 2 infants had complete feeding skill. It has taken 0 to 27 days to develop complete feeding skills with the mean of 7.6 days. There was a negative correlation detected between longer oral feeding skill progression and lower gestational age and birth weight. In conclusion, it shows that the LBW babies and preterm babies have taken longer days to achieve complete feeding skills. These are the indicators for the clinicians to improve the feeding skills in low birth weight babies **(Rosemary White Traut., et al, 2013).**

A descriptive study was conducted to evaluate the epidemiology of neonatal hypothermia in low birth weight preterm infants using WHO temperature criteria. Results demonstrated LBW, caesarean delivery and a low Apgar score were associated with hypothermia. Spontaneous labor and antenatal steroid administration were associated with decreased risk of hypothermia. Moderate hypothermia was associated with higher risk of intraventricular haemorrhage. Moderate and Severe hypothermic conditions were associated with risk of death. It was concluded that hypothermia by WHO criteria is prevalent in LBW infants and is associated with intraventricular haemorrhage and mortality **(Miller S, Lee H & Gould J, 2011).**

A multicentre prospective cohort study was conducted in seven selected hospitals, Brazil. The study objective was to assess the early sucking ability by preterm LBW infants to receive nutrients by oral feeding which is assessed using non-nutritive sucking score system. 199 infants were selected and included in the study. All the infants received non-nutritive sucking assessment based on non-nutritive sucking scoring system, which was performed by neonatal unit's speech therapists. The assessment was performed with a gloved finger of the right hand of the therapist approximately 30 minutes before feeding. The result shows that in the regression analysis, the higher birth weight and gestational age is directly related to the successful sucking ability. In conclusion, the study suggests that the gestational age and birth weight are the determining factor to provide nutrients by oral feeding **(Flavia, C.D, et al, 2010).**

An exploratory descriptive study was carried out in USA, to explore the physiological and behavioural stress in preterm and LBW infants. By using convenience sampling technique, 42 infants were included in the study. The data collection was done in the neonatal intensive care unit. At every 10 minutes observation, heart rate and oxygen saturation levels were recorded for 5 seconds at regular intervals and observational measures of behavioural distress and motor activity were recorded twice a minute. The result shows that the stress cues were more often related to decreased levels of oxygen saturation and increased heart rate. The researcher suggested that neonatal nurses should monitor activity cues in response to care giving and minimize stimuli that evoke stress responses linked to physiological instability **(Lynda Law Horrison., et al, 2004).**

SECTION C: Studies related to the effectiveness of Nesting for the Low Birth Weight Babies.

A quasi experimental study was done to assess the effectiveness of nesting on posture and movement among preterm babies in selected hospitals, Mysore. A sample of 60 preterm babies was selected using convenient sampling technique and assigned in experimental and control group. Data were collected using structured observation checklist for posture and movement. Nesting was provided for the experimental group. The mean posttest scores of posture were 5.42 in posttest 1, 46.14 in posttest 2, 56.82 in posttest 3, which shows highly significant improvement in posture of preterm babies. Similarly the mean posttest score of movement are 36.94 in posttest 1, 15.59 in posttest 2 and 22.80 in posttest 3, which shows that the movement in preterm babies are controlled. Therefore the study concluded that the nesting was an effective method to maintain posture and movement in preterm babies **(Neethu C Joseph, 2016).**

A true experimental study was conducted to determine the effectiveness of nesting on posture, discomfort and physiological parameters among the LBW infants. The study was carried out in NICU of selected government hospitals of Delhi, India. Using stratified random sampling, a total of 60 LBW infants were selected. The study was done for a period of one month. Demographic data was collected using structured interview schedule and posture, discomfort and physiological parameters were assessed using observation checklist and neonatal comfort scale. The result reveals that the mean posttest posture score of babies in experimental group (20.52) is higher than the mean posttest posture score of babies in control group (16.75) and the t value is 8.54 which exceed the table value. The result shows that the LBW infants in experimental group experienced stable physiological parameters during the period of nesting in terms of heart rate and respiratory rate with mean of 140 and 53 respectively. The temperature of LBW infants was found to be stable in both experimental and control group. The study concluded that nesting is effective in improving posture, reduce discomfort and stabilize physiological parameters **(Ramya Paulose., et al, 2015).**

A quasi experimental study was done to assess the effectiveness of nesting on posture and movement of newborn babies in selected hospitals at Nellore,

Andrapradesh. A sample of 60 newborn babies was selected by adopting purposive sampling technique. Demographic variables were collected using structured questionnaire and observation checklist was used to assess posture and movement of newborn babies. The experimental group babies were kept in flexed position by providing a nest with a rolled blanket. The result of the study reveals that the posttest mean score and standard deviation of experimental group babies were 18.8 and 5.77 respectively, the posttest mean score and standard deviation of control group babies were 13.5 and 6.19 respectively and the calculated t value is 3.5 which was more than the tabulated value. The study concluded that nesting is an effective intervention in maintaining good posture and motor performance **(Prasanna K, Radhika M, 2015).**

An experimental study was carried out to investigate the effects of new, alternative positioning device compared to traditional positioning methods used with LBW preterm infants in a tertiary level NICU of Midwestern United States for a period of one year. By using simple random technique, 100 LBW preterm infants were included. Infants were randomized to receive either the alternative positioning device or traditional positioning upon the admission to NICU. Prior to the study, the nursing staff of NICU were educated by research members about these positions. Infants were placed in their assigned positioning. The alternative positioning used for the study is a structured blanket made up of cotton that forms a boundary to infant. Infant underwent neurobehavioral testing using NICU network neurobehavioral scale and feeding assessment using neonatal oral motor assessment scale. The result shows that the infants in the alternative positioning arm demonstrates a significant difference in the neurobehavioral outcome and feeding performance with a mean difference of 1.30 and 0.90 respectively. The study concluded that this alternative positioning is important to be followed in LBW preterm infants to improve the neuro developmental outcomes **(Laura Madlinger Lewis., et al, 2014).**

A meta-analysis was conducted among CINHAL, MEDLINE, Health star, Current contents and unpublished studies to provide a comprehensive review of neuromotor development and related physiologic effects of positioning interventions in LBW infants. 180 reviews on neuromotor development and physiologic effects of positioning intervention were collected. Comparison were made across data sources and result emerged that positioning intervention have a significant impact with

development of posture, muscle tone and physiological benefits. It concluded that postural interventions are recommended for LBW and preterm infants **(Leanne Monturass., et al, 2012).**

A randomized control trial was conducted in NICU of tertiary referral centre in Western Australia. The objective of the study was to determine the effect of postural support nappy and postural support roll on neuromotor function in preterm infants. 123 infants were selected using stratified random sampling technique and assigned in 3 groups. The first group babies were kept in postural support nappy, the second group babies were kept in postural support roll and the third group babies were kept in both alternatively. Pretest and 5 posttests measurements of shoulder and hip posture were performed. The result shows that the infant nursed with a postural support roll and postural support nappy demonstrated improved neuro-motor function **(Monteross, L., et al, 2008).**

A quasi experimental study was conducted to assess the effectiveness of nesting with supine position on posture and movement in healthy preterm infants. The aim of the study was to evaluate whether lying in a nest affects the posture and spontaneous movements of healthy preterm infants. To test this, the posture and motility in preterm infants were evaluated at three ages (early preterm, late preterm and term), when placed in and out of nest. 10 preterm infants with LBW were selected as study participants. All infants underwent three video recordings at the three age periods and each one lasting for an hour. The video recording was observed by three observers. They observed for midline posture and general spontaneous movements. The result shows that lying in a nest had a clear effect on the infant's postural behaviour. Hence it is concluded that placing an infant in a nest facilitates a flexed and adducted posture and reduces abrupt movements and frozen postures **(Ferrari, F., et al, 2007).**

CHAPTER – III

RESEARCH METHODOLOGY

INTRODUCTION

Research methodology is a systematic way to solve a problem. It is the procedure by which researcher go about their work of describing, explaining and predicting phenomena **(Philominathan, 2013).**

The chapter deals with the method adopted for the study and includes the description of research approach, research design, setting of the study, variables, population, sample size, sampling technique, criteria for sample selection, description of the tool, content validity, reliability, pilot study, method of data collection and plan for data analysis.

RESEARCH APPROACH

Research approach involves the description of the plan to investigate the phenomenon under study in a structured, unstructured or a combination of the two methods **(Suresh K Sharma, 2012).**

In the present study, the researcher had adopted Quantitative research approach.

RESEARCH DESIGN

Research design is the overall plan for obtaining answers to the research questions. It indicates how often the data will be collected, what type of comparisons will be made and where the study will be taking place. The research design is the architectural backbone of the study **(Polit and Beck, 2013).**

Pretest posttest control group design was adopted in this study.

Experimental Group: O_1 X X X O_2 X X X O_3

Control Group: O_1 O_2 O_3

O_1 – Pretest on bio – physiological parameters and sucking response in experimental group.

X – Nesting for the low birth weight babies in experimental group.

O_2 – Posttest I on bio – physiological parameters and sucking response in experimental group.

O_3 – Posttest II on bio – physiological parameters and sucking response in experimental group.

O_1 – Pretest on bio – physiological parameters and sucking response in control group.

O_2 – Posttest I on bio – physiological parameters and sucking response in control group.

O_3 – Posttest II on bio – physiological parameters and sucking response in control group.

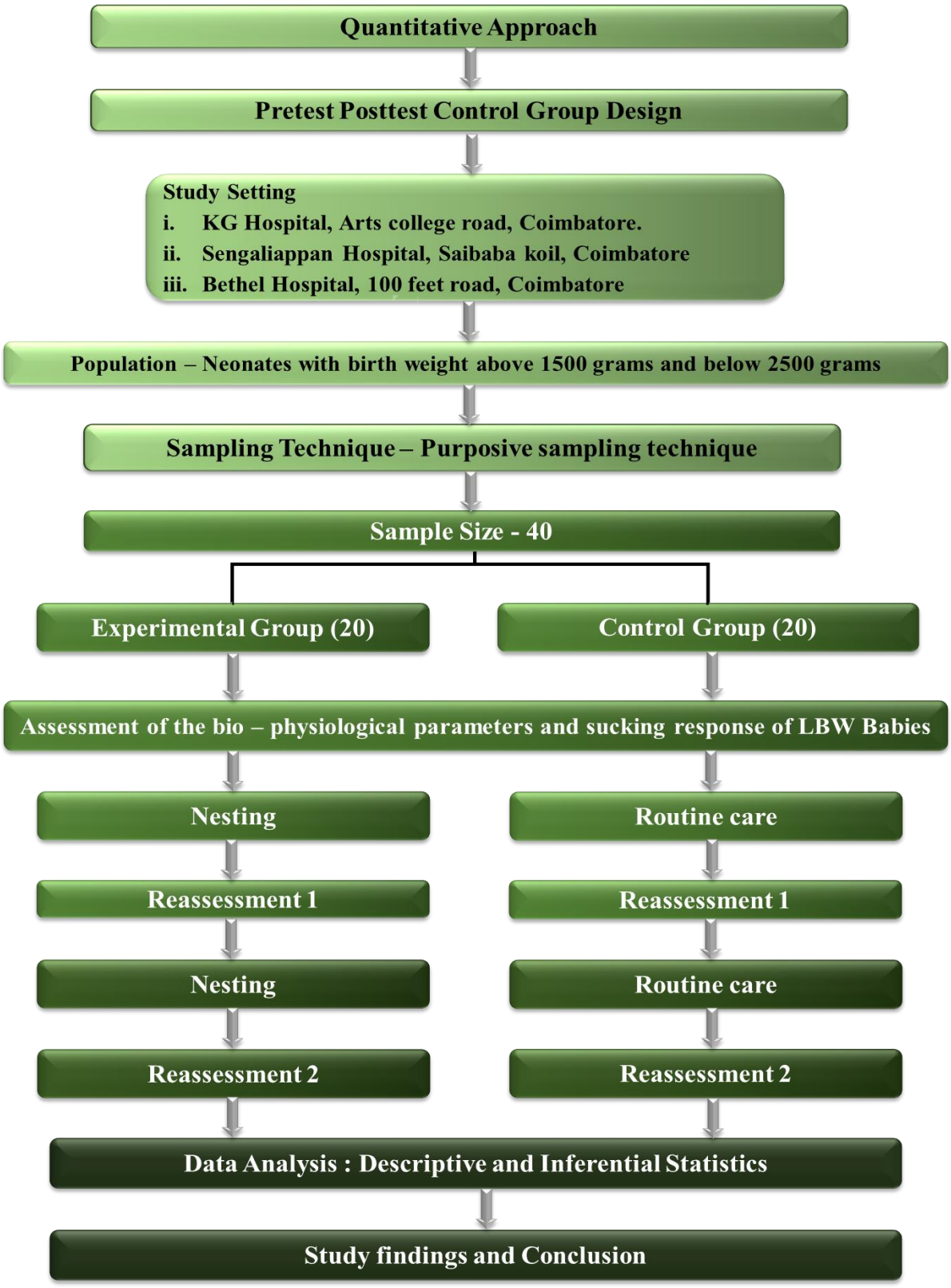

Figure 2: Schematic Representation of Study Design

SETTING OF THE STUDY

The physical location for conducting the research is referred to as setting **(Burns and Groove, 2002).**

The study was conducted in 3 selected hospitals in Coimbatore namely KG hospital, Sengaliappan nursing home and Bethel hospital. They are situated approximately 8Kms away from KG College of Nursing. All the 3 hospitals are located within a distance of 2kms from each other.

KG hospital is a 350 bedded multi super specialty high-tech hospital offering a variety of health care services. Pediatric and Neonatology department in KG hospital is a premier tertiary level department since it takes care of both preventive and curative aspects of children's health. The department has a fully equipped NICU which renders care to high risk neonates with IUGR, preterm, low birth weight, sepsis and other medical and surgical conditions.

Sengaliappan and Bethel hospital are specialized hospitals for Obstetrics and Gynecology care. Approximately 10 to 15 deliveries were conducted on each day. Both hospitals have a specialized neonatology department having a NICU with basic facilities which provides routine care and intensive newborn care to the high risk newborns.

VARIABLES

Variables are characteristics, events or responses that represent the elements of the research question in a detectable and measurable way. In quantitative research, the concepts that are of interest are translated into measurable characteristics called variables **(Rajesh Kumar, 2016).**

Independent Variables

Independent variable is in the hand of researcher and can be manipulated purposefully to see the effect on dependent variable. It is artificially introduced in to a study explicitly to measure an expected outcome **(Rajesh Kumar, 2016).**

Independent variable : Nesting for the low birth weight babies

Dependent Variables

Dependent variable is the outcome of interest. It is expected that an independent variable will have an effect on dependent variable **(Rajesh Kumar, 2016).**

Dependent variables : Bio – physiological parameters and Sucking response of the Low Birth Weight babies.

Influencing Variables

Mother : Age, parity, risks during pregnancy, mode of delivery and birth spacing.

Baby : Age in days, birth weight, gestational age.

Confounding Variables

Confounding variable is a specific type of extraneous variable. It can influence the outcome of the study that is not controlled by the investigator **(Rajesh Kumar, 2016).**

Confounding variables – Radiant warmer and warmness from mother.

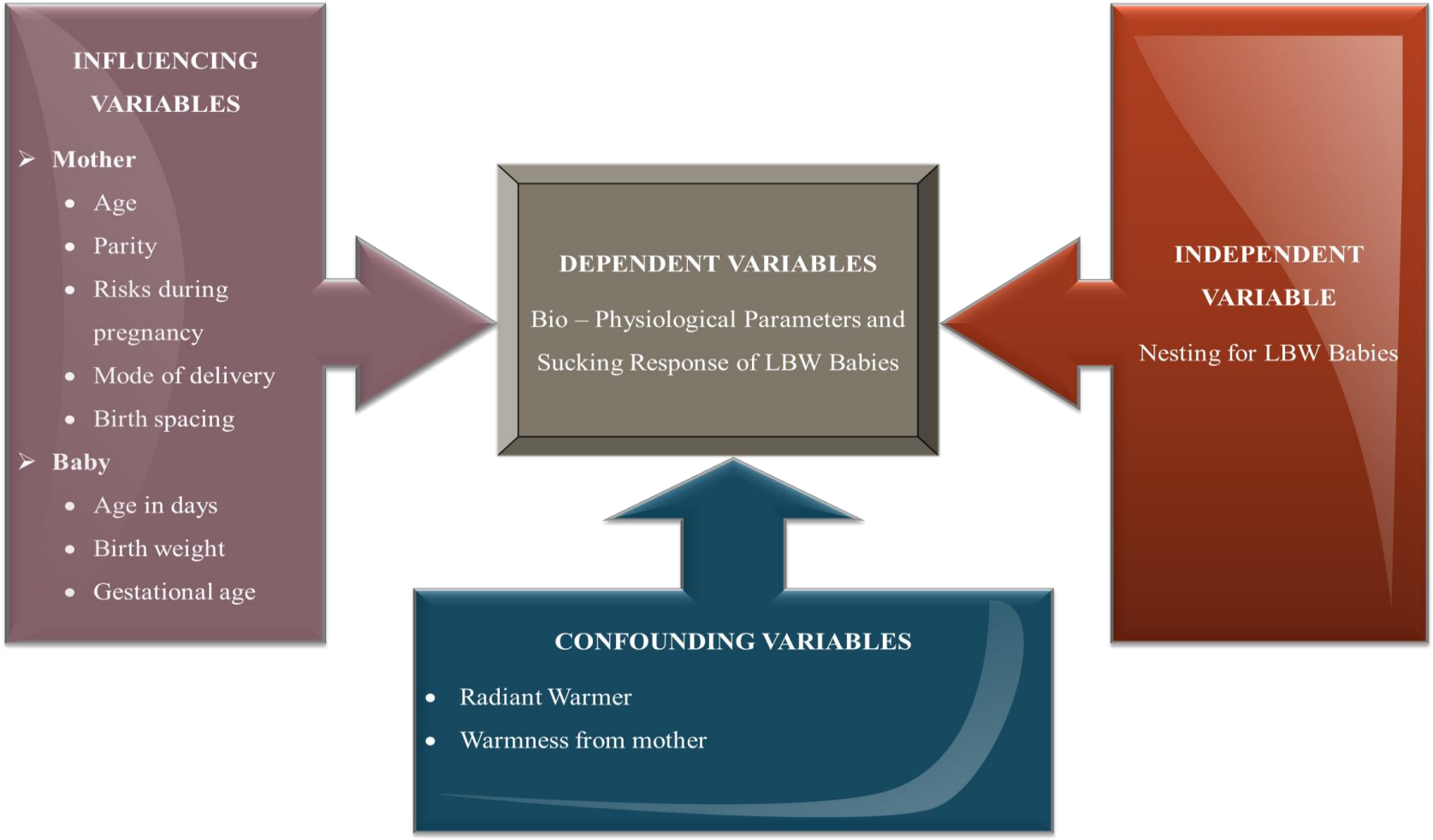

Figure 3: Relationship of Variables

POPULATION

Population is a complete set of persons or objects that possess some common characteristics of interest to the researcher **(Rose Marie, 2009).**

The Neonates who are born with birth weight above 1500 grams and below 2500 grams are considered as target population and among those babies who met inclusion and exclusion criteria and also available at the time of study are considered as accessible population.

SAMPLE SIZE

The sample size was determined by using sample size determination formula

$$\textbf{Sample size (n)} = \left[\frac{\textbf{S. } t_{(n-1\ \alpha/2)}}{\textbf{d}} \right]^{\textbf{2}}$$

Where,

S = variance = $\sqrt{S^2} = \sqrt{4.89} = 2.21$

t = tabulated value = 2.57

d = marginal error = 0.9

Therefore,

$$\textbf{n} = \left[\frac{\textbf{2.21 X 2.57}}{\textbf{0.9}} \right]^{\textbf{2}}$$

= 39.82 which is equivalent to 40.

Hence, sample size taken for the study is 40.

SAMPLING TECHNIQUE

Sampling is the process of selecting cases to represent an entire population so that inferences about the population can be made **(Polit and Beck, 2013).**

Purposive sampling technique was adopted for this study. The low birth weight babies who met the inclusion and exclusion criteria were selected purposively and included in the study.

CRITERIA FOR SAMPLE SELECTION

Inclusion criteria

- Neonates with the birth weight between 1500 grams and 2500 grams.
- Neonates whose age is less than 7 days.
- Low birth weight babies with the gestational age between 34 weeks and 37 weeks of gestation.
- Low birth weight babies whose parents are permitting to provide nesting for their babies.
- Low birth weight babies those who are admitted in the hospital and stay for 3 days or more.

Exclusion criteria

- Neonates who were on CPAP or ventilator.
- Neonates who were diagnosed of severe medical and surgical conditions
- Neonates who were with major congenital anomalies.
- Neonates whose APGAR score is less than 7.

DESCRIPTION OF THE TOOL

The Tool consists of three sections

- **SECTION A: Demographic Variables**

Part I: Demographic Variables of mothers of LBW babies

It consists of age, height, type of conception, parity, risk during

pregnancy, mode of delivery and birth spacing.

Part II: Demographic Variables of LBW babies

It consists of age in days, gender, birth weight, gestational age, birth order and mode of sucking.

- **SECTION B: Bio – Physiological Parameters**

It consists of Temperature (F), Heart rate (beats/min), Respiratory rate (breaths/min) and Oxygen saturation (%).

- **SECTION C: Sucking Response**

It comprises of a 3 point scale consisting 15 statements of feeding skills was adopted and modified from Early Feeding Skills Assessment Scale and it is used to assess the sucking response among low birth weight babies. The maximum score is 2 and minimum score is 0. The scores are interpreted as,

SCORE	SUCKING RESPONSE
21 – 30	Good Sucking Response
11 – 20	Fair Sucking Response
1 – 10	Poor Sucking Response

CONTENT VALIDITY

Content validity is the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain **(Polit and Beck, 2013).**

The tool was submitted to various experts of the Department of Child Health Nursing. A criterion rating scale for validation of the tool was developed. Experts were requested to give their opinions and valuable suggestions about the content of the tool. Minor modifications as suggested by the experts were incorporated in the final preparation of the tool.

RELIABILITY

Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it is designed to measure **(Suresh K Sharma, 2012).**

The reliability of the tool was checked by using the split half method. It showed the reliability for the structured observation checklist to assess sucking response, r = 0.95. Hence the tool was found to be reliable.

PILOT STUDY

Pilot study is the smaller version of a proposed study conducted to develop and refine the methodology, such as treatment or intervention, measurement instruments, or data collection process to be used in the large study **(Rajesh Kumar, 2016).**

The researcher conducted the pilot study in KG Hospital, Coimbatore. The pilot study was conducted to know the possibility and to take measures to overcome the expected difficulties in the main study. After getting permission from the management, the study was conducted for 6 newborn with LBW for a period of one week. The tool used for the study was found to be feasible. After conducting the pilot study, the researcher made modifications in the tool and proceeded with the main study.

METHOD OF DATA COLLECTION

A written prior permission was obtained to conduct this study in 3 selected hospitals, Coimbatore. The researcher personally explained the purpose of the study to the managing directors of the hospitals and got permission. Data collection was done for a period of one month.

By using purposive sampling technique, based on the inclusion and exclusion criteria, 40 samples were selected from 3 hospitals, in Coimbatore and assigned to experimental and control group. Informed consent was obtained from the mothers of the newborn. The demographic data of mother and newborn were obtained from the mothers by using structured interview method and clinical data were collected from case records.

On the first day the bio – physiological parameters and sucking response were assessed (pretest) in both experimental and control group by using digital thermometer, pulse oximeter and manual count of respiratory rate and modified early feeding skills assessment scale respectively. Observation of each newborn took about 30 minutes and the study was conducted for each newborn for three consecutive days.

The babies in the experimental group were kept in nesting on the same day and for next 2 days. Nesting was provided for 2 hours in morning and 2 hours in evening and posttests were done after nesting. The bio – physiological parameters and sucking response were assessed in the evening of the second and third day (posttest I and posttest II) by using the same tool for both experimental and control group.

PLAN FOR DATA ANALYSIS

Data was analysed on the basis of objectives and testing of hypothesis by using descriptive and inferential statistics.

(i) Descriptive statistics were used to analyse the frequency, percentage, mean and standard deviation of the following variables.

a. Demographic variables of mothers and LBW babies
b. Bio – physiological parameters
c. Sucking response

(ii) Inferential statistics were used to determine comparison and association

a. ANOVA was used to compare the pretest and posttests scores of sucking response, temperature, heart rate, respiratory rate and oxygen saturation in experimental and control group.
b. Z test was used to compare the posttest II scores of sucking response, temperature and oxygen saturation between experimental and control group.
c. Chi – square test was used to associate sucking response scores of the low birth weight babies and selected demographic variables.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Data analysis is the process of systematically applying statistical and or logical techniques to describe and illustrate, condense and evaluate data. It provides a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data **(Shamoo and Resnik, 2008).**

The process of interpretation is essentially one of stating that what the findings show. The findings of the study are the results, conclusions, interpretations, recommendations, generalizations, implications, future research and nursing practice **(BT Basavanthappa, 2010).**

This chapter deals with the analysis and interpretation of data collected from 40 Low Birth Weight babies in selected hospitals, Coimbatore. The collected data was analysed by using descriptive and inferential statistics.

The study findings are tabulated as follows

Table 4.1 Distribution of demographic variables among the mothers of the Low Birth Weight babies.

Table 4.2 Distribution of demographic variables among the Low Birth Weight babies.

Table 4.3 Mean and Standard deviation of the bio – physiological parameters among the Low Birth Weight babies in experimental and control group.

Table 4.4 Distribution of sucking response scores among the Low Birth Weight babies.

Table 4.5 Comparison of pretest and posttests of bio – physiological parameters among the Low Birth Weight babies in experimental group.

Table 4.6 Comparison of pretest and posttests of bio – physiological parameters among the Low Birth Weight babies in control group.

Table 4.1 Distribution of demographic variables among the mothers of the LBW babies.

n = 40

S. No	Demographic Variables	Experimental Group		Control Group	
		No	%	No	%
1.	Age of the mother				
	a) Upto 25 years	7	35	11	55
	b) 25 to 30 years	6	30	6	30
	c) Above 30 years	7	35	3	15
2.	Height of the mother				
	a) Up to 150 cm	6	30	6	30
	b) More than 150 cm	14	70	14	70
3.	Type of conception				
	a) Normal	17	85	17	85
	b) ART	3	15	3	15
4.	Parity				
	a) Primi gravida	9	45	9	45
	b) Multi gravida	11	55	11	55
5.	Risk during pregnancy				
	a) No complications	4	20	5	25
	b) GDM	1	5	1	5
	c) PIH	2	10	6	30
	d) Anaemia	3	15	3	15
	e) Other complications	10	50	5	25
6.	Mode of delivery				
	a) Normal vaginal delivery	7	35	7	35
	b) Assisted vaginal delivery	0	0	1	5
	c) LSCS	13	65	12	60
7.	Birth spacing between children				
	a) Less than 2 years	4	20	5	25
	b) More than 2 years	7	35	6	30
	c) Not applicable	9	45	9	45

The table shows that,

Regarding age of the mother, in the experimental group, 7 (35%) of them are below 25 years, 6 (30%) of them are in between 25 to 30 years and 7 (35%) of them are above 30 years of age. In the control group, 11 (55%) of them are below 25 years, 6 (30%) of them are in between 25 to 30 years and 3 (15%) of them are above 30 years of age.

Regarding height of the mother, in the experimental group, 6 (30%) of them are up to the height of 150cm and 14 (70%) of them are more than the height of 150 cm. In the control group, 6 (30%) of them are up to the height of 150cm and 14 (70%) of them are more than the height of 150 cm.

Regarding type of conception, in the experimental group, 17 (85%) of them had normal conception and 3 (15%) of them had assisted reproductive technique. In the control group, 17 (85%) of them had normal conception and 3 (15%) of them had assisted reproductive technique.

Regarding the parity, in the experimental group, 9 (45%) of them are primigravida and 11 (55%) of them are multigravida. In the control group, 9 (45%) of them are primigravida and 11 (55%) of them are multigravida.

Regarding risk during pregnancy, in the experimental group, 4 (20%) of them have no complications, 1 (5%) mother had gestational diabetes mellitus, 2 (10%) of them had pregnancy induced hypertension, 3 (15%) of them had anaemia and 10 (50%) of them had other complications such as twin pregnancy, hypothyroidism, etc. In the control group, 5 (25%) of them have no complications, 1 (5%) mother had gestational diabetes mellitus, 6 (30%) of them had pregnancy induced hypertension, 3 (15%) of them had anaemia and 5 (25%) of them had other complications such as twin pregnancy, hypothyroidism, etc.

Regarding mode of delivery, in the experimental group, 7 (35%) of them had normal vaginal delivery and 13 (65%) of them had LSCS. In the control group, 7 (35%) of them had normal vaginal delivery, 1 (5%) of them had assisted vaginal delivery and 12 (60%) of them had LSCS.

Regarding birth spacing between children, in the experimental group, 4 (20%) of them have less than 2 years, 7 (35%) of them have more than 2 years and 9 (45%) of them are primi mothers. In the control group, 5 (25%) of them have less than 2 years, 6 (30%) of them have more than 2 years and 9 (45%) of them are primi mothers.

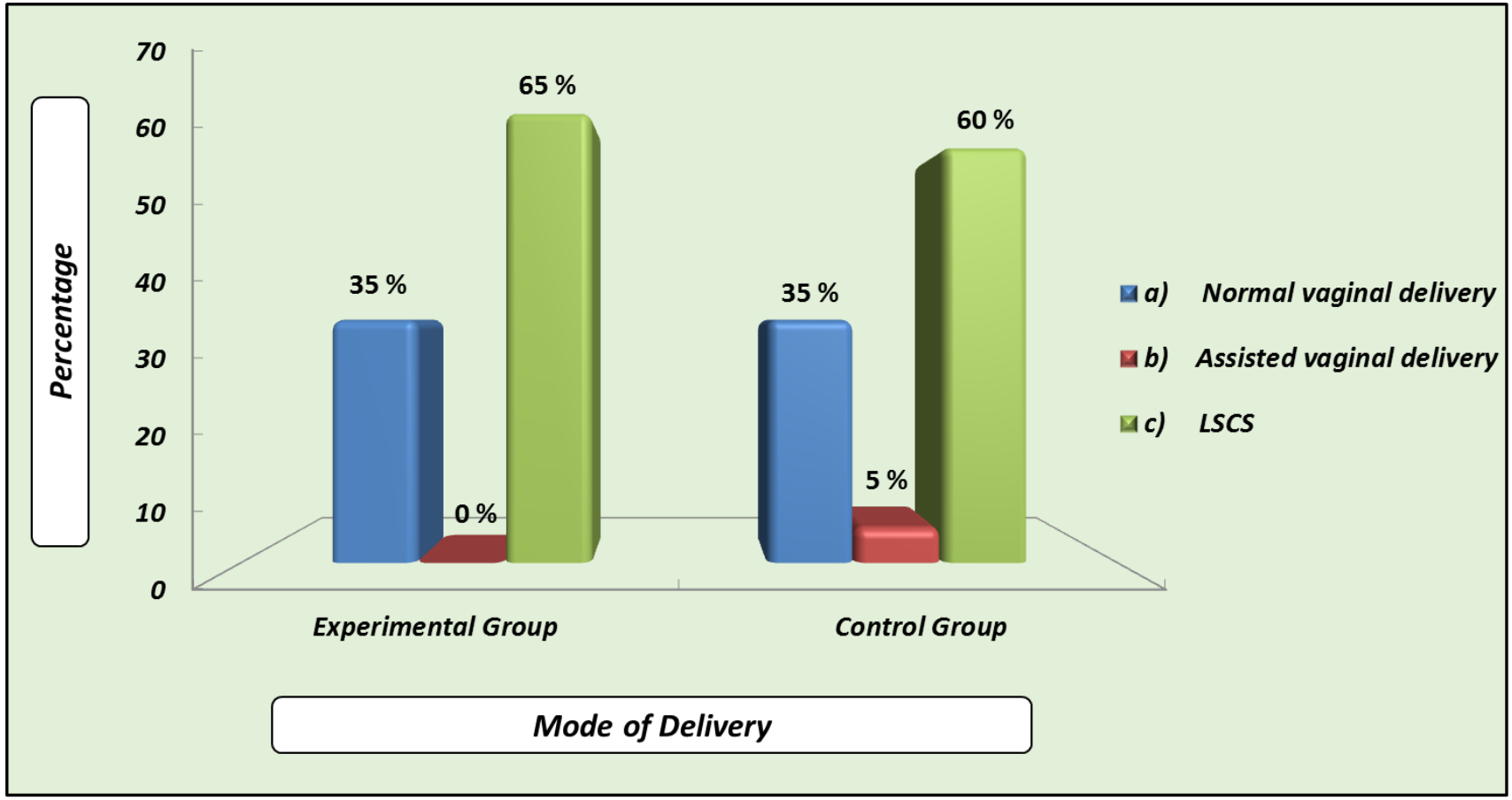

Figure 4: Distribution of mode of delivery among the mothers of the low birth weight babies in experimental and control group

Table 4.2 Distribution of demographic variables among the Low Birth Weight babies.

n = 40

S. No	Demographic Variables	Experimental Group		Control Group	
		No	%	No	%
1.	Age of the baby				
	a) First day	10	50	7	35
	b) Second day	10	50	6	30
	c) Third day and more	0	0	7	35
2.	Gender				
	a) Male	9	45	12	60
	b) Female	11	55	8	40
3.	Birth weight				
	a) 1.5 Kg to 2.0 Kg	10	50	6	30
	b) 2.01 Kg to 2.5 Kg	10	50	14	70
4.	Gestational age				
	a) 37 weeks of gestation	6	30	4	20
	b) 36 weeks of gestation	4	20	11	55
	c) 35 weeks of gestation	4	20	4	20
	d) 34 weeks of gestation	6	30	1	5
5.	Birth order of the child				
	a) First	9	45	9	45
	b) Second	10	50	9	45
	c) Third and more	1	5	2	10
6.	Mode of sucking				
	a) Nutritive sucking	12	60	16	80
	b) Non – Nutritive sucking	8	40	4	20

The table shows that,

Regarding age of the baby, in the experimental group, 10 (50%) of them are on 1st day of age and 10 (50%) of them are on 2nd day of age. In the control group, 7 (35%) of them are on 1st day of age, 6 (30%) of them are on 2nd day of age and 7 (35%) of them are on 3rd day of age.

Regarding gender of the baby, in the experimental group, 9 (45%) of them are male babies and 11 (55%) of them are female babies. In the control group, 12 (60%) of them are male babies and 8 (40%) of them are female babies.

Regarding birth weight of the baby, in the experimental group, 10 (50%) of them are born with birth weight between 1.5 Kg to 2.0 Kg and 10 (50%) of them are born with birth weight between 2.01 Kg to 2.5 Kg. In the control group, 6 (30%) of them are born with birth weight between 1.5 Kg to 2.0 Kg and 14 (70%) of them are born with birth weight between 2.1 Kg to 2.5 Kg.

Regarding gestational age of the baby, in the experimental group, 6 (30%) of them are born at 37 weeks, 4 (20%) of them are born at 36 weeks, 4 (20%) of them are born at 35 weeks and 6 (30%) of them are born at 34 weeks. In the control group, 4 (20%) of them are born at 37 weeks, 11 (55%) of them are born at 36 weeks, 4 (20%) of them are born at 35 weeks and 1 (5%) of them is born at 34 weeks.

Regarding birth order of the child, in the experimental group, 9 (45%) of them are first child, 10 (50%) of them are second child and 1 (5%) baby is third child. In the control group, 9 (45%) of them are first child, 9 (45%) of them are second child and 2 (10%) of them are third child.

Regarding mode of sucking, in the experimental group, 12 (60%) of them have nutritive sucking and 8 (40%) of them have non-nutritive sucking. In the control group, 16 (80%) of them have nutritive sucking and 4 (20%) of them have non-nutritive sucking.

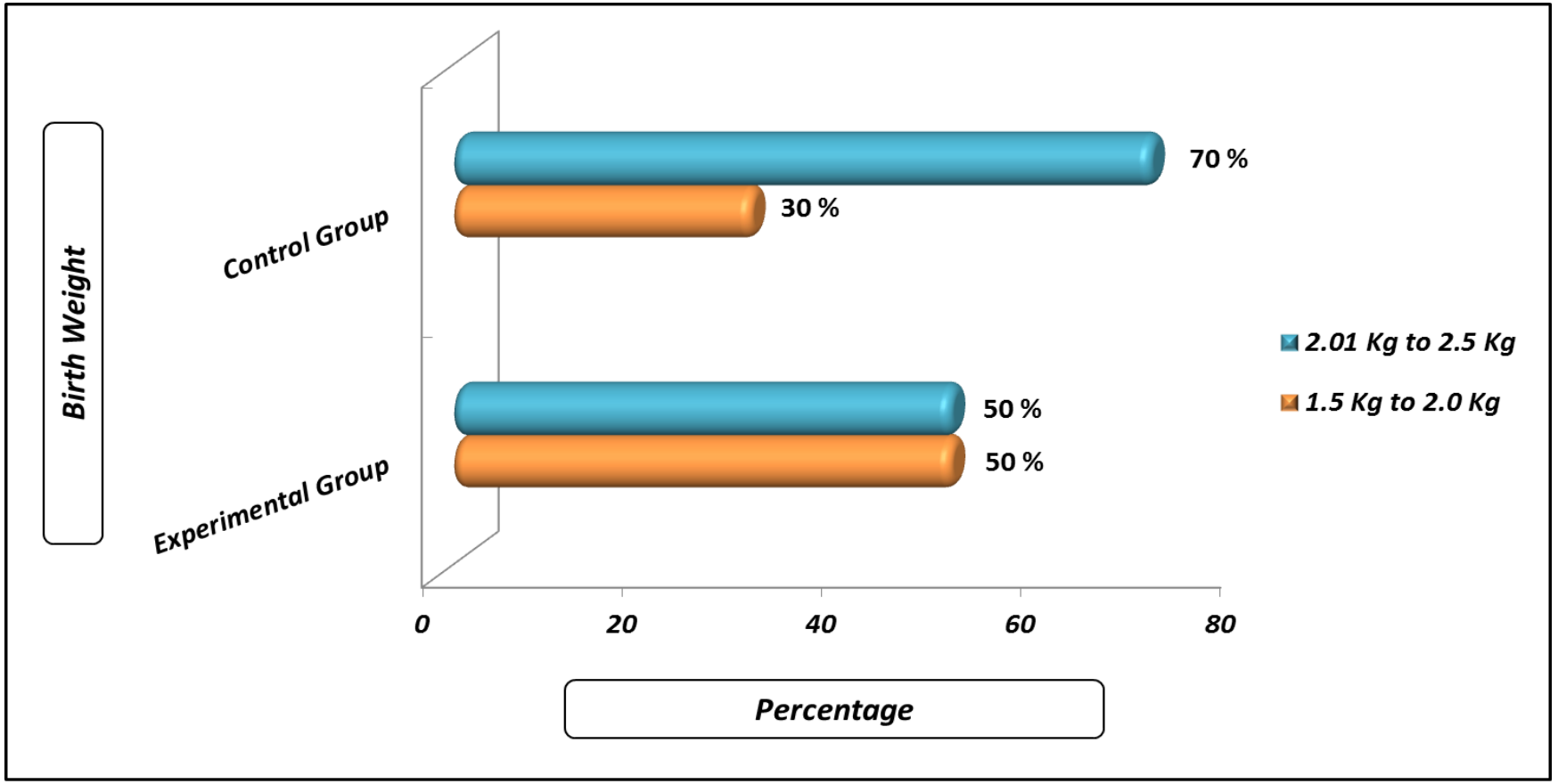

Figure 5: Distribution of Birth Weight among the low birth weight babies in experimental and control group

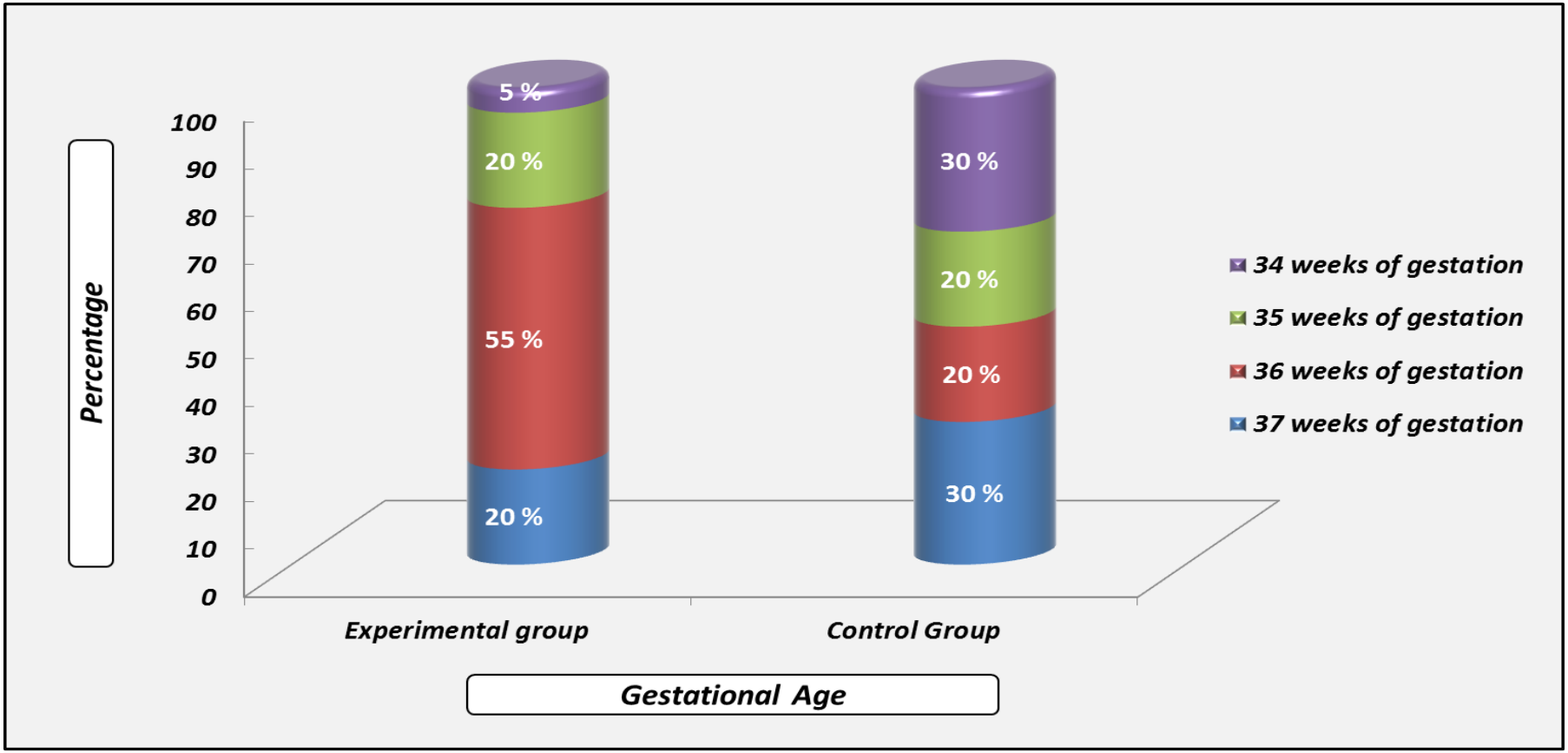

Figure 6: Distribution of Gestational age among the low birth weight babies in experimental and control group

Table 4.3 Mean and Standard deviation of the bio – physiological parameters among the LBW babies in experimental and control group.

n = 40

S. No	Bio – Physiological Parameters		Experimental Group		Control Group	
			Mean	SD	Mean	SD
1.	Temperature	Pretest Posttest I Posttest II	95.9 97 97.7	0.47 0.32 1.96	96 96.5 96.8	0.47 0.37 0.37
2.	Heart Rate	Pretest Posttest I Posttest II	155 141 131	5.49 5.0 5.6	154 151 150	5.26 4.09 3.19
3.	Respiratory Rate	Pretest Posttest I Posttest II	57 46 38	6.89 4.40 5.49	54 52 51	5.55 3.70 2.63
4.	Oxygen Saturation	Pretest Posttest I Posttest II	88 93 96	1.85 1.57 1.15	89 91 91	1.43 0.81 0.83

The above table shows that,

Regarding mean scores of temperature, in the experimental group there is an increase in posttest II (97.7) than posttest I (97) and pretest (95.9). In the control group also there is an increase in posttest II (96.8) than posttest I (96.5) and pretest (96).

Regarding mean scores of heart rate, in the experimental group there is a decrease in posttest II (131) than posttest I (141) and pretest (155). In the control group also there is a decrease in posttest II (150) than posttest I (151) and pretest (154).

Regarding mean scores of respiratory rate, in the experimental group there is a decrease in posttest II (38) than posttest I (46) and pretest (57). In the control group also there is a decrease in posttest II (51) than posttest I (52) and pretest (54).

Regarding mean scores of oxygen saturation, in the experimental group there is an increase in posttest II (96) than posttest I (93) and pretest (88). In the control group also there is an increase in posttest II (91) than posttest I (91) and pretest (89).

Table 4.4 Distribution of sucking response scores among the LBW babies.

n = 40

S. No	Sucking Response	Experimental Group						Control Group					
		Pretest		Posttest I		Posttest II		Pretest		Posttest I		Posttest II	
		No	%	No	%	No	%	No	%	No	%	No	%
1.	Good Sucking Response	0	0	0	0	6	30	0	0	0	0	2	10
2.	Fair Sucking Response	3	15	13	65	14	70	2	10	7	35	17	85
3.	Poor Sucking Response	17	85	7	35	0	0	18	90	13	65	1	5

The table shows that,

In experimental group, concerning the sucking response among the LBW babies, In pretest, none of them had good sucking response, 3 (15%) of them had fair sucking response and 17 (85%) of them had poor sucking response. In posttest I, none of them had good sucking response, 13 (65%) of them had fair sucking response and 7 (35%) of them had poor sucking response where as in posttest II, 6 (30%) of them had good sucking response, 14 (70%) of them had fair sucking response and none of them had poor sucking response.

In control group, in pretest, none of them had good sucking response, 2 (10%) of them had fair sucking response and 18 (90%) of them had poor sucking response. In posttest I, none of them had good sucking response, 7 (35%) of them had fair sucking response and 13 (65%) of them had poor sucking response where as in posttest II, 2 (10%) of them had good sucking response, 17 (85%) of them had fair sucking response and 1 (5%) of them had poor sucking response.

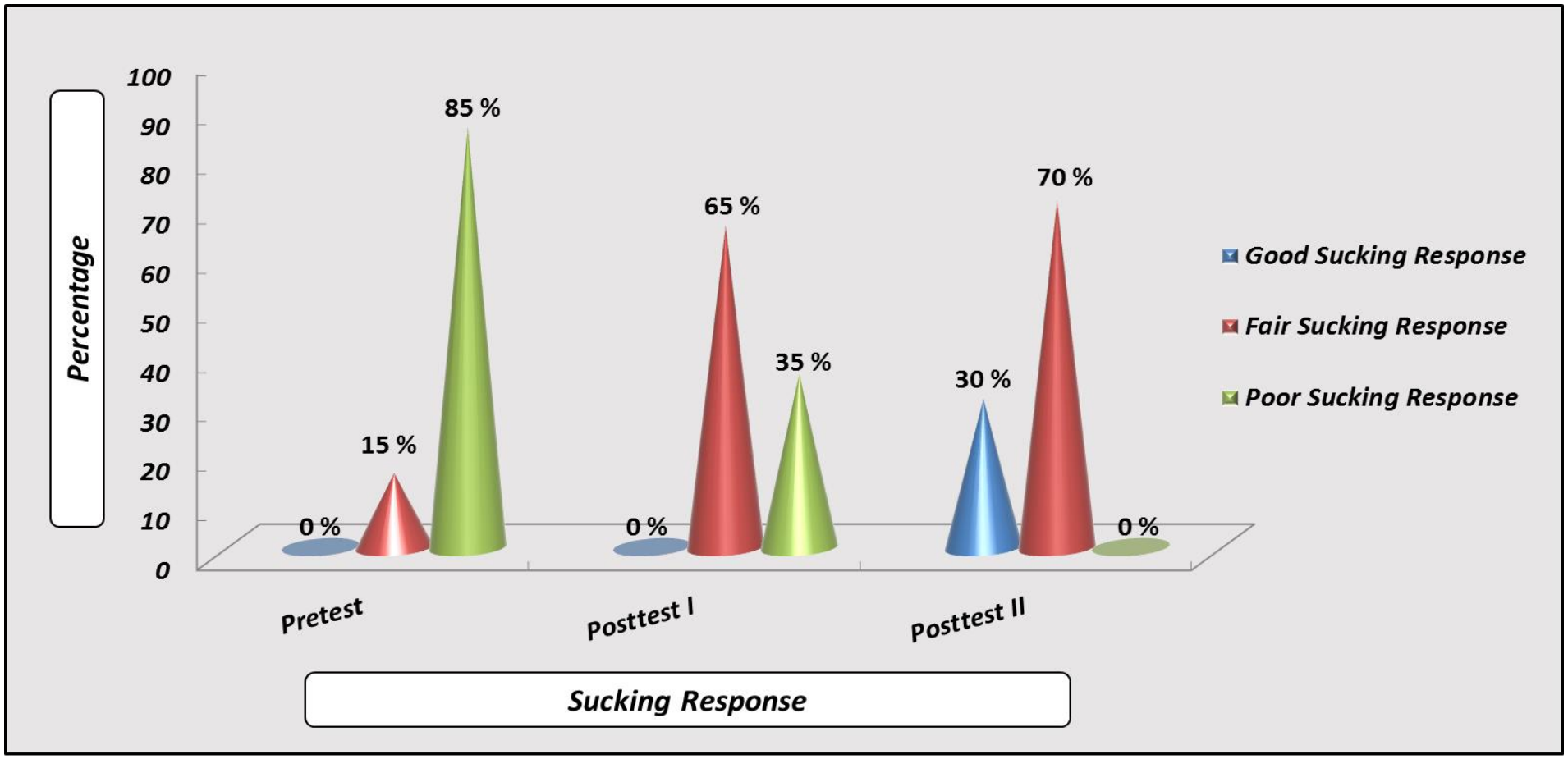

Figure 7: Distribution of Sucking Response among the low birth weight babies in experimental group

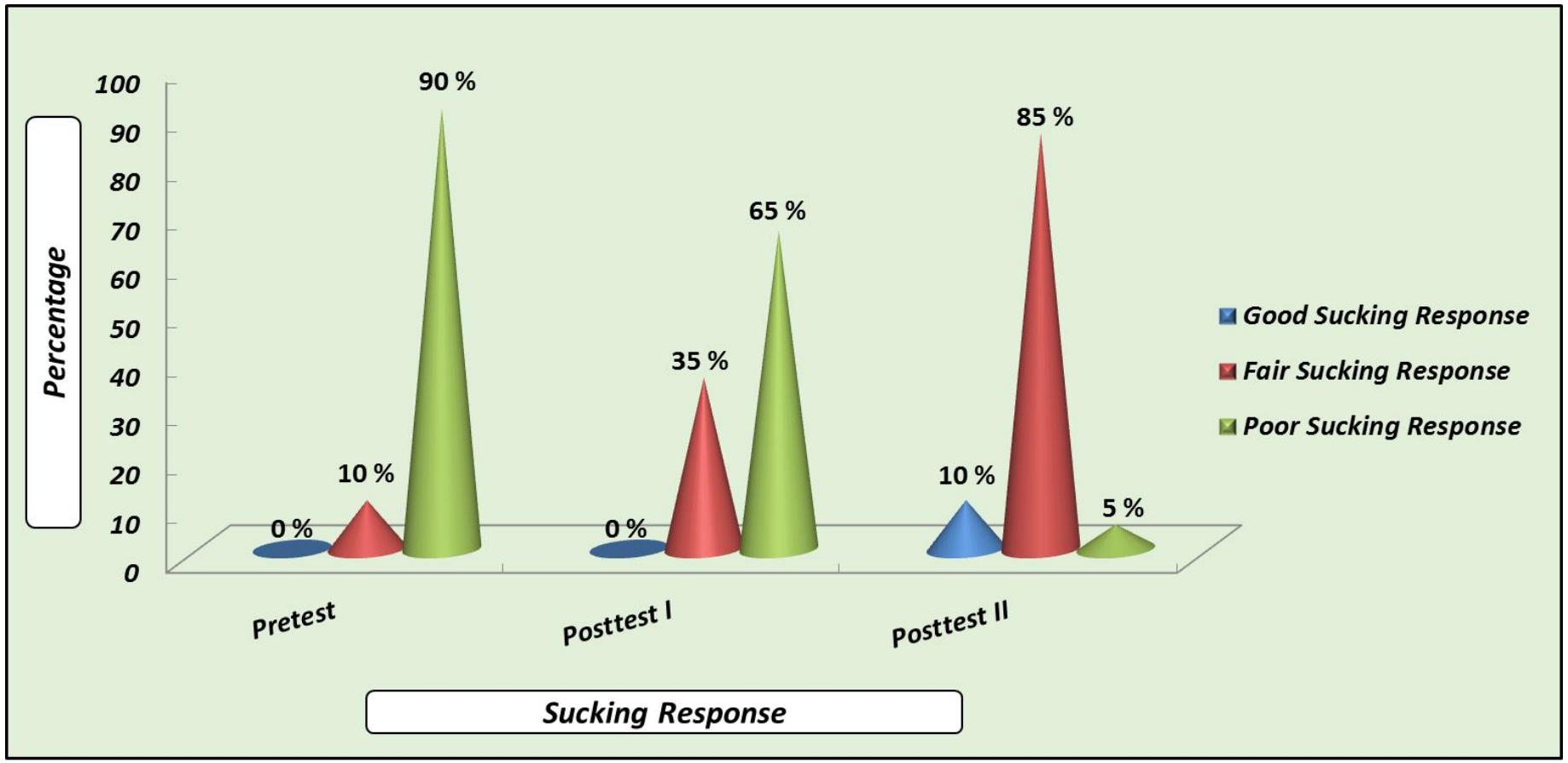

Figure 8: Distribution of Sucking Response among the low birth weight babies in control group

Table 4.5 Comparison of pretest and posttests of bio – physiological parameters among the Low Birth Weight babies in experimental group.

n = 20

Parameters	Source	Degrees of Freedom	Sum of Square	Mean Sum of Squares	Repeated Measures of ANOVA	Table value of F at 5% level of significance
Temperature	Between Values of Temperature	2	32.93	16.47	F = 11.28	F = 3.162
	Errors	57	83.04	1.46		
	Total	59	115.97			
Heart Rate	Between Values of Heart rate	2	5634.11	2817.06	F = 92.91	
	Errors	57	1728.22	30.32		
	Total	59	7362.33			
Respiratory Rate	Between Values of Respiratory rate	2	3752.93	1876.47	F = 55.19	
	Errors	57	1938.00	34		
	Total	59	5690.93			
Oxygen Saturation	Between Values of Oxygen Saturation	2	543.90	271.95	F =107.92	
	Errors	57	143.70	2.52		
	Total	59	687.60			

The above table shows that,

In comparison of pretest, posttest I and posttest II scores on temperature, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference between pretest, posttest I and posttest II scores on temperature among the LBW babies in experimental group. Hence it is proven that nesting is effective in maintaining the thermal balance for the LBW babies.

In comparison of pretest, posttest I and posttest II scores on heart rate, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest, posttest I and posttest II scores on heart rate among the LBW babies in experimental group. Hence it shows that nesting is effective in stabilizing the heart rate for the LBW babies.

In comparison of pretest, posttest I and posttest II scores on respiratory rate, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest, posttest I and posttest II scores on respiratory rate among the LBW babies in experimental group. Hence it implies that nesting is effective in stabilizing the respiratory rate for the LBW babies.

In comparison of pretest, posttest I and posttest II scores on oxygen saturation, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest, posttest I and posttest II scores on oxygen saturation among the LBW babies in experimental group. Hence it signifies that nesting is effective in stabilizing the oxygen saturation for the LBW babies.

Table 4.6 Comparison of pretest and posttests of bio – physiological parameters among the LBW babies in control group.

n = 20

Parameters	Source	Degrees of Freedom	Sum of Square	Mean Sum of Squares	Repeated Measures of ANOVA	Table value of F at 5% level of significance
Temperature	Between Values of Temperature	2	6.66	3.33	F = 9.59	F = 3.162
	Errors	57	9.92	0.17		
	Total	59	16.58			
Heart Rate	Between Values of Heart rate	2	182.80	91.40	F = 4.81	
	Errors	57	1082.60	18.99		
	Total	59	1265.40			
Respiratory Rate	Between Values of Respiratory rate	2	86.80	43.40	F = 3.41	
	Errors	57	1027.60	18.03		
	Total	59	1114.40			
Oxygen Saturation	Between Values of Oxygen Saturation	2	23.70	11.85	F = 9.96	
	Errors	57	67.55	1.19		
	Total	59	91.25			

The above table shows that,

In comparison of pretest, posttest I and posttest II scores on temperature, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a minimal significant difference between pretest, posttest I and posttest II scores on temperature among the LBW babies in control group. Hence it implies that there is a minimal thermal balance for the LBW babies with the routine care.

In comparison of pretest, posttest I and posttest II scores on heart rate, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a minimal significant difference between pretest, posttest I and posttest II scores on heart rate among the LBW babies in control group. Hence it shows that there is a minimal stability in the heart rate of the LBW babies with the routine care.

In comparison of pretest, posttest I and posttest II scores on respiratory rate, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a minimal significant difference between pretest, posttest I and posttest II scores on respiratory rate among the LBW babies in control group. Hence it implies there is a minimal stability in the respiratory rate of the LBW babies with the routine care.

In comparison of pretest, posttest I and posttest II scores on oxygen saturation, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a minimal significant difference between pretest, posttest I and posttest II scores on oxygen saturation among the LBW babies in control group. Hence it shows there is a minimal stability in the oxygen saturation for the LBW babies with the routine care.

Table 4.7 Comparison of pretest and posttests sucking response among the LBW babies in experimental group.

n = 20

Source	Degrees of Freedom	Sum of Square	Mean Sum of Square	Repeated Measures of ANOVA	Table value of F at 5% level of significance
Between Sucking Response Scores	2	1167.43	583.72	F = 92.22	F = 3.162
Errors	57	360.50	6.33		
Total	59	1527.93			

The above table shows that,

In comparison of pretest, posttest I and posttest II, the calculated value of F is greater than the tabulated value of F at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest, posttest I and posttest II score on sucking response among the low birth weight babies in experimental group. Hence it is proven that nesting is effective in improving the sucking response of the low birth weight babies.

Table 4.8 Comparison of pretest and posttests sucking response among the LBW babies in control group.

n = 20

Source	Degrees of Freedom	Sum of Square	Mean Sum of Square	Repeated Measures of ANOVA	Table value of F at 5% level of significance
Between Sucking Response Scores	2	72.13	36.07	F = 0.868	F = 3.162
Errors	57	2369.85	41.56		
Total	59	2441.98			

The above table shows that,

In comparison of pretest, posttest I and posttest II, the calculated value of F is lesser than the tabulated value of F at 5% level of significance. So the null hypothesis is accepted. Therefore, there is no significant difference between pretest, posttest I and posttest II score on sucking response among the low birth weight babies in control group. Hence it is seen that there is no improvement in sucking response among the low birth weight babies in control group.

Table 4.9 Comparison of posttest II temperature among the LBW babies between experimental and control group.

n = 40

Temperature	Mean	SD	Calculated Value of Z	Table value of Z at 5% level of significance
Experimental Group	97.7	1.96	1.973	1.96
Control Group	96.8	0.37		

The above table shows that,

The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference in posttest II scores of temperature among the low birth weight babies between experimental group and control group. Hence it signifies that nesting is effective in maintaining the thermal balance for the low birth weight babies.

Table 4.10 Comparison of posttest II oxygen saturation level among the LBW babies between experimental and control group.

n = 40

Oxygen Saturation Level	Mean	SD	Calculated Value of Z	Table value of Z at 5% level of significance
Experimental Group	96	1.15	15.09	1.96
Control Group	91	0.83		

The above table shows that,

The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference in posttest II scores of oxygen saturation among the low birth weight babies between experimental and control group. Hence it shows evidence that nesting is effective in stabilizing the oxygen saturation for the low birth weight babies.

Table 4.11 Comparison of posttest II sucking response among the LBW babies between experimental and control group.

n = 40

Sucking Response	Mean	SD	Calculated Value of Z	Table value of Z at 5% level of significance
Experimental Group	18.15	3.09	3.721	1.96
Control Group	14.5	3.11		

The above table shows that,

The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference in the posttest II scores of sucking response among the low birth weight babies between experimental and control group. Hence it implies that nesting is effective in improving the sucking response of the low birth weight babies.

Table 4.12 Association between the pretest sucking response of the LBW babies and selected demographic variables in experimental group. n = 20

S. No	Demographic Variables	Below Mean	Above Mean	Calculated value of χ^2	Tabulated value of χ^2 at 5% level of significance
1.	Height of the mother				
	a) Up to 150cm	2	4	1.20	
	b) More than 150cm	10	4	(NS)	
2.	Parity				
	a) Primi gravida	7	2	<1	
	b) Multi gravida	6	5	(NS)	3.841
3.	Risk during pregnancy				
	a) No complications	3	1	<1	
	b) With complications	9	7	(NS)	
4.	Mode of delivery				
	a) vaginal delivery	6	1	1.548	
	b) LSCS	6	7	(NS)	
5.	Birth spacing				
	a) less than 2 years	2	2	<1	5.991
	b) more than 2 years	4	3	(NS)	
	c) not applicable	6	3		
6.	Age of the baby				
	a) 1st day	7	3	<1	
	b) 2nd day and more	5	5	(NS)	
7.	Gender				
	a) male	5	4	<1	
	b) female	7	4	(NS)	
8.	Birth weight of the baby				
	a) 1.5 kg to 2.0 kg	9	1	**5.208**	
	b) 2.1 kg to 2.4 kg	3	7	**(S)**	3.841
9.	Gestational age of the baby	3	7	**5.208**	
	a) 36 to 37 weeks	9	1	**(S)**	
	b) 35 to 34 weeks				
10.	Birth order of the child				
	a) First child	6	3	<1	
	b) Second and more	6	5	(NS)	
11.	Mode of sucking				
	a) Nutritive sucking	5	7	2.51	
	b) Non – Nutritive sucking	7	1	(NS)	

S – Significant **NS – Not significant**

The table shows the association between the pretest sucking response of the LBW babies and selected demographic variables in the experimental group. The table shows the calculated value of χ^2 and the tabulated value of χ^2 at 5% level of significance.

Therefore,

Regarding birth weight of the baby, the calculated value of χ^2 is greater than the tabulated value of χ^2 at 5% level of significance. Therefore, there is an association between the birth weight and sucking response of the low birth weight babies.

Regarding gestational age of the baby, the calculated value of χ^2 is greater than the tabulated value of χ^2 at 5% level of significance. Therefore, there is an association between the gestational age and sucking response of the low birth weight babies.

There is no significant association between other demographic variables and sucking response.

Table 4.13 Association between the pretest sucking response of the LBW babies and selected demographic variables in control group.

n = 20

S. No	Demographic Variables	Below Mean	Above Mean	Calculated value of χ^2	Tabulated value of χ^2 at 5% level of significance
1.	Height of the mother				
	a) Up to 150cm	2	4	<1	
	b) More than 150cm	6	8	(NS)	
2.	Parity				
	a) Primi gravida	5	5	<1	
	b) Multi gravida	3	7	(NS)	3.841
3.	Risk during pregnancy				
	a) No complications	1	4	<1	
	b) With complications	7	8	(NS)	
4.	Mode of delivery				
	a) vaginal delivery	2	6	<1	
	b) LSCS	6	6	(NS)	
5.	Birth spacing				
	a) less than 2 years	1	4		
	b) more than 2 years	2	4	1.851	5.991
	c) not applicable	5	4	(NS)	
6.	Age of the baby				
	a) 1st day	4	3	<1	
	b) 2nd day and more	4	9	(NS)	
7.	Gender				
	a) male	6	6	<1	
	b) female	2	6	(NS)	
8.	Birth weight of the baby				
	a) 1.5 kg to 2.0 kg	5	1	**4.375**	
	b) 2.1 kg to 2.4 kg	3	11	**(S)**	3.841
9.	Gestational age of the baby	6	9	<1	
	a) 36 to 37 weeks	2	3	(NS)	
	b) 35 to 34 weeks				
10.	Birth order of the child				
	a) First child	5	4	<1	
	b) Second and more	3	8	(NS)	
11.	Mode of sucking				
	a) Nutritive sucking	5	11	1.06	
	b) Non – Nutritive sucking	3	1	(NS)	

S – Significant **NS – Not significant**

The table shows the association between the pretest sucking response of the low birth weight babies and selected demographic variables in the control group. The table shows the calculated value of χ^2 and the tabulated value of χ^2 at 5% level of significance.

Therefore,

Regarding birth weight of the baby, the calculated value of χ^2 is greater than the tabulated value of χ^2 at 5% level of significance. Therefore, there is an association between the birth weight and sucking response of the low birth weight babies.

There is no significant association between other demographic variables and sucking response.

CHAPTER – V

RESULTS AND DISCUSSIONS

The purpose of the study was to assess the effectiveness of nesting on bio – physiological parameters and sucking response among the low birth weight babies. The result was based on statistical analysis. ANOVA was used to compare the pretest and posttests scores of bio – physiological parameters and sucking response in experimental and control group. The comparison of bio – physiological parameters and sucking response among the low birth weight babies between the experimental and control group was assessed by using Z test. Chi – square test was used to find out the association of sucking response with selected demographic variables. The results of the study have been discussed according to the stated objectives.

1. To assess the bio – physiological parameters and sucking response among the Low Birth Weight babies.

The bio – physiological parameters such as temperature, heart rate, respiratory rate and oxygen saturation were assessed using digital thermometer, pulse oximeter and manual count of respiratory rate. The sucking response was assessed using modified early feeding skill assessment scale.

Table 4.3 shows the mean and standard deviation of the bio – physiological parameters among the low birth weight babies in experimental and control group. The table reveals that the pretest Mean and SD of temperature in experimental group are 95.9 and 0.47 and in control group 96 and 0.47 respectively. The pretest Mean and SD of heart rate in experimental group are 155 and 5.49 and in control group 154 and 5.26 respectively. The pretest Mean and SD of respiratory rate in experimental group are 57 and 6.89 and in control group 54 and 5.55 respectively. The pretest Mean and SD of oxygen saturation in experimental group are 88 and 1.85 and in control group 89 and 1.43 respectively.

Table 4.4 shows the distribution of sucking response among the low birth weight babies in experimental and control group. The table reveals that in the pretest, in experimental group, 17 (85%) LBW babies had poor sucking response and 3 (15%) low birth weight babies had fair sucking response. In control group, 18 (90%) low

birth weight babies had poor sucking response and 2 (10%) low birth weight babies had fair sucking response.

The present study findings are seen in an experimental study conducted to assess the effectiveness of kangaroo mother care on the vital signs of low weight preterm newborns in a selected hospital, Brazil. Samples of 22 healthy low weight preterm newborns were selected as samples for the study. The vital signs such as heart rate, respiratory rate, mean arterial pressure, temperature and peripheral oxygen saturation were assessed using a cardiac monitor, pulse oximetry, thermometer respectively. It was found during the pretest that the mean heart rate was 144, mean respiratory rate was 54, mean oxygen saturation was 89 and mean temperature was 96.9. In pretest it shows that there is a physiological instability. After the assessment, the baby was placed vertically in front of the mother with head turned sideways. The baby stayed in kangaroo position for 30 minutes and after that vital signs were collected again. The result shows that there is an increase in body temperature (98.2), increase in oxygen saturation (94.5) and decrease in heart rate (142) and respiratory rate (36). It concludes that kangaroo mother care improves the vitals of low birth weight babies **(Almeida, CM., et al, 2007).**

2. To assess the effectiveness of Nesting on the bio – physiological parameters and sucking response among the Low Birth Weight babies in the experimental group.

Table 4.5 shows the comparison of pretest and posttests bio – physiological parameters among the low birth weight babies in experimental group. The calculated value of F is greater than the tabulated value of F at 5% level of significance. So, the null hypothesis is rejected. Therefore, there is a significant difference between pretest and posttest scores on temperature among the low birth weight babies in experimental group. Hence it implies that nesting is effective in maintaining the thermal balance for the low birth weight babies.

The table also reveals that the calculated value of F is greater than the tabulated value of F at 5% level of significance. So, the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest and posttest scores on heart rate among the low birth weight babies in experimental group. Hence it

implies that nesting is effective in stabilizing the heart rate for the low birth weight babies.

The table also explains that the calculated value of F is greater than the tabulated value of F at 5% level of significance. So, the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest and posttest scores on respiratory rate among the low birth weight babies in experimental group. Hence it implies that nesting is effective in stabilizing the respiratory rate for the low birth weight babies.

The table also communicates that the calculated value of F is greater than the tabulated value of F at 5% level of significance. So, the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest and posttest scores on oxygen saturation among the low birth weight babies in experimental group. Hence it implies that nesting is effective in stabilizing the oxygen saturation for the low birth weight babies.

Table 4.7 shows the comparison of pretest and posttests sucking response among the low birth weight babies in experimental group. The table communicates that the calculated value of F is greater than the tabulated value of F at 5% level of significance. So, the null hypothesis is rejected. Therefore, there is a highly significant difference between pretest and posttest scores on sucking response among the low birth weight babies in experimental group. Hence it is proven that nesting is effective in improving the sucking response of the low birth weight babies.

In control group, there is a significant difference in bio – physiological parameters between pretest and posttest scores. It shows that there is a minimal stability in bio – physiological parameters due to routine care. There is no significant difference in sucking response between pretest and posttest scores. It shows that there is no improvement in sucking response.

Hence it is proven that nesting is effective in maintaining the thermal balance, stabilizing the bio – physiological parameters and improving the sucking response.

3. To compare the bio – physiological parameters and sucking response among the Low Birth Weight babies between experimental and control group.

Table 4.9 shows the comparison of posttest II temperature among the low birth weight babies between experimental and control group. The result shows that during the posttest II, the Mean and SD of temperature in experimental group are 97.7 and 1.96 and in control group 96.8 and 0.37 respectively. The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference in posttest II scores of temperature among the low birth weight babies between experimental and control group.

Table 4.10 shows the comparison of posttest II oxygen saturation among the low birth weight babies between experimental and control group. The result shows that during the posttest II, the Mean and SD of oxygen saturation in experimental group are 96 and 1.15 and in control group 91 and 0.83 respectively. The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference in posttest II scores of oxygen saturation among the low birth weight babies between experimental and control group.

Table 4.11 shows the comparison of posttest II sucking response among the low birth weight babies between experimental and control group. The result shows that during the posttest II, the Mean and SD of sucking response in experimental group are 18.15 and 3.09 and in control group 14.5 and 3.11 respectively. The calculated value of Z is greater than the tabulated value of Z at 5% level of significance. So the null hypothesis is rejected. Therefore, there is a significant difference between posttest II score on sucking response among the low birth weight babies in experimental and control group.

Hence, it is proven that the nesting is an effective intervention in stabilizing the bio – physiological parameters and improving the sucking response among the low birth weight babies.

The present study findings are supported by an experimental study conducted to assess the effectiveness of nesting upon bio – physiological parameters,

neuro – behavioural activity and sucking response among neonates in a selected hospital, Chennai. Sixty neonates were selected using simple random technique and assigned in experimental group (30) and control group (30). The study was done for a period of 4 weeks. Tools used in the study are neonatal variable proforma and obstetrical variable proforma to obtain demographic variables, observation sheets to assess bio – physiological parameters, brazelton neonatal neuro – behavioural assessment scale to assess the neuro – behavioural activity and sucking behavioural scale to assess the sucking response. The nest was given for 6 hours daily consecutively for a period of 2 days. The result shows that the Mean and SD of temperature in control group were 98.27 and 0.26 respectively which is lower than the Mean and SD of temperature in experimental group (98.37 & 0.31). It also shows that the posttest score of temperature in experimental group is greater than the pretest score of temperature (97.63 & 0.20). The study also revealed that the Mean and SD of sucking response of newborn babies in control group before nesting (8.16 & 2.02) and after nesting (7.19 & 1.78) which does not show significant improvement whereas in experimental group, the Mean and SD of sucking response of newborn babies before nesting (9.88 & 2.36) and after nesting (12.35 & 2.15) was high and shows significant improvement at 5% level of significance. Thus, the study concludes that by nesting, the alterations in thermoregulation can be reduced and can improve the sucking response. Hence nesting is an effective intervention in stabilizing the bio – physiological parameters and improving the sucking response for the neonates **(Jaya Jasmine & Latha Venkatesan, 2013).**

4. To associate the findings with the selected demographic variables.

Chi – square test was used to identify the association with selected demographic variables of mother and low birth weight baby such as height of mother, parity, risk during pregnancy, mode of delivery, birth spacing and age of baby, gender, birth weight of baby, gestational age, birth order and mode of sucking.

Table 4.12 shows the association between the pretest sucking response and selected demographic variables in the experimental group. It is concluded that there is an association between the birth weight and sucking response and gestational age and sucking response in experimental group.

Table 4.13 shows the association between the pretest sucking response and selected demographic variables in the control group. It is concluded that there is an association between the birth weight and sucking response in control group.

The same observation is seen in a descriptive study which was done to identify the factors related to newborn sucking ability in a tertiary care medical centre, Chicago. About 203 samples were selected using convenience sampling technique. The result shows that the variables of birth weight and gestational age were positively correlated with sucking ability. It was concluded that there is an association between the birth weight and gestational age and sucking ability of the newborn **(Nancy J mac mullen, Laura A dalski, 2010).**

CONCLUSION

Children are the gift and reward from the Lord. The most precious jewels that a woman will ever wear around the neck are the arms of their children. It is our prime responsibility to provide maximum comfort to the newborn babies which will reduce the physiological instability and stress in adjusting to external environment. Nesting is one of the measure to keep the baby comfortable. The present study has been supported by various series of other studies. Hence from the data analysis and results, it was concluded that nesting is an effective intervention to stabilize the bio – physiological parameters and to improve the sucking response among the low birth weight babies.

CHAPTER – VI

SUMMARY, RECOMMENDATIONS, LIMITATIONS AND NURSING IMPLICATIONS

SUMMARY

The intention of the study was to assess the effectiveness of nesting on bio – physiological parameters and sucking response among the low birth weight babies. The objectives of the study were formulated according to the need of the study. The conceptual framework adopted for the study was based on the modified Levine's conservation model of nursing, 1973.

An extensive review of literature, professional experience and expert's direction helped the researcher to design the methodology. The study was conducted in 3 selected hospitals in Coimbatore where adequate samples were easily accessible. Pretest posttest control group design was adopted for this study. The tools used for this study were Structured questionnaire and case records to obtain demographic data of mother and baby, Digital Thermometer, Pulse oximeter and manual count of respiratory rate to assess the bio – physiological parameters and Modified early feeding skill assessment scale to assess the sucking response among the low birth weight babies. The content validity of the tool was obtained from various experts in Child Health Nursing Department. Reliability of the tool was checked using split – half method. The reliability of early feeding skill assessment scale to assess sucking response was found to be r = 0.95. Thus, the tool was found to be reliable. The ethical aspect of the research was maintained throughout the study period. Formal written permission was obtained from the hospitals to conduct the study and oral consent was obtained from the mothers of newborn to include as study subjects. The collected information was kept confidential.

Pilot study was conducted in KG Hospital, Coimbatore for a period of one week with 6 low birth weight babies. The result of the pilot study was satisfactory and hence the investigator proceeded with the main study. The main study was done for a period of one month at three selected hospitals in Coimbatore, namely KG hospital, Sengaliappan nursing home and Bethel hospital. The researcher personally explained the purpose of the study to mother and got permission from them. Fourty low birth

weight babies were selected (n = 40) using purposive sampling technique and assigned in experimental and control group. Pretest was done for both experimental and control group on the first day using digital thermometer, pulse oximeter and manual count of respiratory rate and modified early feeding skill assessment scale. After pretest, Nesting was given by researcher on the same day and for next two consecutive days for the babies in experimental group. Posttest I and II for both experimental and control group was done on second day and third day respectively using the same tool.

The data were organized, analysed and interpreted using descriptive and inferential statistics. The demographic variables of mother and baby and the distribution of sucking response among low birth weight babies were tabulated by using frequency distribution. The effectiveness of nesting and comparison between pretest, posttest I and posttest II scores on bio-physiological parameters and sucking response were analysed by using ANOVA and Z test. It was found that the values were statistically significant at 5% level.

By using Chi – square analysis, association between the pretest scores of sucking response and selected demographic variables of mothers and low birth weight babies such as height of mother, parity, risk during pregnancy, mode of delivery, birth spacing, age of baby, gender, birth weight of baby, gestational age, birth order and mode of sucking was done respectively. The result shows that there is an association between birth weight and gestational age with sucking response among the low birth weight babies.

The result of the study revealed that the nesting is an effective intervention to stabilize the bio – physiological parameters and to improve the sucking response for the low birth weight babies who were born in KG hospital, Sengaliappan nursing home and Bethel hospital, Coimbatore.

RECOMMENDATIONS

This study recommends the following for further research.

- The study can be replicated by using a large sample thereby findings can be generalized.

- Studies can be conducted to find out the factors that influence the bio – physiological parameters and sucking response of the LBW babies.
- Prospective study can be done to find out the long term outcomes in the LBW babies with poor sucking response.
- Comparative study can be conducted to assess the sucking response among babies born by normal vaginal delivery and LSCS.
- Comparative study can be done to assess the sucking response among the LBW babies on direct breast feeding and expressed breast milk or formula feeding.
- Prospective study can be done to assess the effectiveness of nesting on length of stay in hospital and number of days in phototherapy.
- Studies can be conducted to assess the effectiveness of structured teaching programme on knowledge and practice regarding handling the LBW babies with nesting among NICU staff nurses.
- Similar studies can be done among the LBW preterm babies on ventilator.

LIMITATIONS

- The study has limited evidence separately on sucking response for the LBW babies.
- The study could not evaluate the long term outcome of the effect of nesting among the LBW babies because of time constrain.
- The positive effect shown by the babies in the control group might have occurred due to routine newborn care according to the hospital protocol in which researcher could not have any control on it.

NURSING IMPLICATIONS

Some of the implications from the study in various areas of nursing are as follows:

NURSING PRACTICE

- Health care institutions should follow nesting in the newborn care and motivate pediatric nurses to adopt nesting procedure in newborn care.

- The health care institutions can include nesting in the newborn care protocol.
- Nesting should be used as a therapeutic comfort equipment for all the newborn babies.
- Nesting should be used by the nurses in NICU to position the babies with ventilator, CPAP, phototherapy, etc.
- Nurses can encourage the mothers to keep their newborn babies in nesting since it gives comfortable position.

NURSING EDUCATION

- Nursing curriculum has to focus on the modern methods and technologies in newborn care and to improve the skills of student nurses in providing updated newborn care.
- Periodic seminars and workshops can be conducted for the student nurses regarding various methods and positions in using nesting for newborn babies.
- An awareness programme can be organized by student nurses for mothers about the practice of nesting in home based newborn care and their benefits, in postnatal wards and community areas.

NURSING ADMINISTRATION

- The nurse administrator should encourage all the staff nurses in NICU to keep the babies in nesting.
- The nurse administrator should conduct in-service education for the pediatric staff nurses to improve the skills in the practice of nesting.
- The nurse as an administrator must aim to translate the benefits of nesting Nation-wide in order to minimize the discomforts experienced by these tiny newborns.

NURSING RESEARCH

- The study can be used for valuable references for various research scholars.
- The result of this study can be taken for evidence based practice in order to implement the nesting in NICUs of all hospital.

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APPENDIX – A

K.G. COLLEGE OF NURSING

(Affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai)
K.G. Hospital and Post Graduate Medical Institute
Arts College Road, Coimbatore - 641 018, India
Tel : (0422)-2212121, 2219191, 2222222 Fax : (0422)-2211212
E-mail : drgb@kggroup.com, Web : www.kghospital.org

LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY

To

Respected Madam/Sir,

Sub: Requisition for permission to conduct the study.

This is to bring your kind notice that **Ms. Phebe Esther Philominal.J**, M.Sc. (N) II year student of K.G College of Nursing is conducting a research on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE"**, for the purpose of submission to the Tamilnadu Dr. M.G.R. Medical University, Chennai, as a partial fulfillment for the requirement for the award of M.Sc. Nursing Degree.

I Kindly request you to grant her permission to conduct this study in your hospital. Further details of the proposed project, if required will be furnished by the student personally.

Kindly do the needful.

Thanking you,

Yours truly,

Prof. Sonia Das

PRINCIPAL

PRINCIPAL
K.G. COLLEGE OF NURSING
K.G. HOSPITAL
ARTS COLLEGE ROAD
COIMBATORE - 641 018.

APPENDIX – B

K.G. COLLEGE OF NURSING

(Affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai)
K.G. Hospital and Post Graduate Medical Institute
Arts College Road, Coimbatore - 641 018, India
Tel : (0422)-2212121, 2219191, 2222222 Fax : (0422)-2211212
E-mail : drgb@kggroup.com, Web : www.kghospital.org

LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY

To

Mrs. Vaijayanthi Mohan Das,

Director of Nursing,

K.G. Hospital,

Coimbatore.

Respected Madam/Sir,

Sub: Requisition for permission to conduct the study.

This is to bring your kind notice that **Ms. Phebe Esther Philominal.J**, M.Sc. (N) II year student of K.G College of Nursing is conducting a research on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE",** for the purpose of submission to the Tamilnadu Dr. M.G.R. Medical University, Chennai, as a partial fulfillment for the requirement for the award of M.Sc. Nursing Degree.

I Kindly request you to grant her permission to conduct this study in your hospital. Further details of the proposed project, if required will be furnished by the student personally.

Kindly do the needful.

Thanking you,

Yours truly,

Prof. Sonia Das
PRINCIPAL

PRINCIPAL
K.G. COLLEGE OF NURSING
K.G. HOSPITAL
ARTS COLLEGE ROAD
COIMBATORE - 641 018.

28/11/

VAIJAYANTHI
Director - Education
K.G. College of Nursing
K.G. Hospital
Coimbatore - 641 01

DR. SENGALIAPPAN NURSING HOME

580, NSR ROAD, SAIBABA COLONY, COIMBATORE - 641 011.

Ref. No.

Date 05/11/2016

To,

The Principal
KG college of Nursing
Arts c ollege Road
Coimbatore – 641018

Dear Sir/Madam,

Sub: Permission for project work

With reference to your letter dated 04/11/2016 , the management is pleased to grant permission to Ms.Phebe Esther Philominal.J, MSC.(N) II year student to undergo research study titled " A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE, in the department of paediatrics of this hospital for the period of one month.

Yours Sincerely

Dr. SENGALIAPPAN NURSING HOME
580, NSR Road, Saibaba Colony,
Coimbatore - 641 011.
Ph: 0422-2434585, 2435585,

N.B. :This Nursing Home has been approved for Family Welfare Programme vide proceeding of the District Collector R.No. 4184 / 84 / A-4 dated 21-7-84 as per G.O. M.S. No. 2109 Health and Family Welfare Department Dated 19.10.82

BETHEL HOSPITAL PVT. LTD.

223, Dr. Rajendra Prasad Road, 100 Feet Road, Coimbatore - 641 012.
☎ : 0422 - 2499339, 2498884, 2499119, 2499009, Fax : 0422 - 2496147

17.11.2016

To,

The Principal

KG College of Nursing,

Arts College Road,

Coimbatore-641018.

Dear Sir / Madam,

Sub: Permission for Project Work

With reference to your letter, the management is pleased to grant permission to **Ms. Phebe Esther Philominal.J, Msc (N), II Year**, student to undergo research study titled **"A study to Assess the Effectiveness of Nesting on Bio- Physiological Parameters and Sucking Response Among Low Birth Weight Babies"** in the department of Paediatrics of this Hospital for the period of one month and 2 weeks.

BETHEL HOSPITAL Dr. Rajendra Prasad Road Coimbatore

For Bethel Hospital (P) Ltd.

12/11/2016

Managing Director / Director

APPENDIX – C

K.G. COLLEGE OF NURSING

(Affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai)
K.G. Hospital and Post Graduate Medical Institute
Arts College Road, Coimbatore - 641 018, India
Tel : (0422)-2212121, 2219191, 2222222 Fax : (0422)-2211212
E-mail : drgb@kggroup.com, Web : www.kghospital.org

LETTER SEEKING EXPERTS OPINION FOR CONTENT VALIDITY OF THE TOOL

From,

Ms. Phebe Esther Philominal. J,
II Year M.Sc. Nursing,
K.G. College of Nursing,
Coimbatore.

To,

Dr. Anita David,
HOD, Child Health Nursing,
Sri Ramachandra College of Nursing,
Porur, Chennai - 116

Through The Principal of K.G. College of Nursing

PRINCIPAL
K. G. COLLEGE OF NURSING
K. G HOSPITAL
ARTS COLLEGE ROAD,
COIMBATOR -641 018.

Respected Madam/Sir,

Sub: Requisition for expert opinion and suggestions for content validity of the tool.

I am a student of M.Sc. Nursing II year, in K.G College of Nursing, Coimbatore, affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai, as a partial fulfillment of M.Sc. Nursing Programme, I am conducting a study on **"A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE".**

Here with I am sending the developed tool for content validity and for your expert opinion and possible suggestions. I will be very kind of you to return the same to the undersigned at the earliest possible.

Thanking you,

Date:

Place: Coimbatore

Yours faithfully

Phebe Esther. J

(Ms. Phebe Esther)

APPENDIX – D

FORMAT FOR CONTENT VALIDITY

Name of the expert:

Designation:

Name of the Institution:

Respected Madam/ Sir,

Kindly go through the content and place the right ( ) mark against the checklist in the following columns ranging from relevant to not relevant. Wherever there is a need for modification, kindly give your valuable opinion in the remarks column.

SECTION A

DEMOGRAPHIC VARIABLES

PART I: DEMOGRAPHIC VARIABLES OF MOTHERS

Item No.	Relevant	Need Modification	Not Relevant	Remarks
1.				
2.				
3.				
4.				
5.				
6.				
7.				

PART II: DEMOGRAPHIC VARIABLES OF LBW BABIES

Item No.	Relevant	Need Modification	Not Relevant	Remarks
1.				
2.				
3.				
4.				
5.				
6.				

SECTION B

BIO – PHYSIOLOGICAL PARAMETERS

(Temperature, Heart Rate, Respiratory Rate and Oxygen Saturation)

Relevant	Need Modification	Not Relevant	Remarks

SECTION C

SUCKING RESPONSE

"Modified Early Feeding Skills Assessment Scale"

Item No.	Relevant	Need Modification	Not Relevant	Remarks
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

CERTIFICATE FOR TOOL VALIDATION

This is to certify that the tool constructed by **Reg. No: 301515902**, II year M.Sc Nursing student of K.G. College of Nursing, which is to be used in her study titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG THE LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE"** has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide.

SIGNATURE WITH SEAL

NAME:

DESIGNATION:

COLLEGE:

PLACE:

DATE:

APPENDIX – E

LIST OF EXPERTS FOR CONTENT VALIDITY

1. **Dr. Srinivasan. C, M.D**,
   Pediatrician and Neonataologist,
   K.G. Hospital,
   Coimbatore.

2. **Dr. Kamal Kanth. A, M.B.B.S, DCH, Fellow Neonatology, DDN**
   Neonataologist,
   Sengaliappan Nursing Home,
   Coimbatore.

3. **Prof. Mrs. Lizze Raveendran, M.Sc (N),**
   Principal,
   GEM Institute of Nursing Education & Research,
   Coimbatore.

4. **Prof. Dr. Anita David, M.Sc (N), PhD,**
   HOD, Department of Child Health Nursing,
   Sri Ramachandra College of Nursing,
   Chennai.

5. **Mrs. Nagalakshmi, M.Sc (N),**
   Professor,
   Sri.Gokulam College of Nursing,
   Salem.

6. **Mrs. Beryl Juliet, M.Sc (N),**
   Professor,
   Sri. Ramakrishna Institute of Paramedical Sciences,
   Coimbatore.

7. **Mrs. Annal Jebarathinam, M.Sc (N),**
   Assistant Professor,
   RVS College of Nursing,
   Coimbatore.

8. **Mrs. Ruby Anitha, M.Sc (N),**
   Assistant Professor,
   Ganga Institute of Health Sciences,
   Coimbatore.

APPENDIX - F

CERTIFICATE FOR ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by **Reg. No: 301515902**, II year M.Sc. Nursing student of K.G. College of Nursing, for dissertation on the topic **"A STUDY TO ASSESS THE EFFECTIVENESS OF NESTING ON BIO – PHYSIOLOGICAL PARAMETERS AND SUCKING RESPONSE AMONG THE LOW BIRTH WEIGHT BABIES IN SELECTED HOSPITALS, COIMBATORE"** is edited for English language appropriateness by **Prof. JOSEPHINE PRINCEY, M.A., M.Phil. B.Ed.,** K.G. College of Nursing.

SIGNATURE

APPENDIX - G

TOOLS

SECTION A – DEMOGRAPHICVARIABLES

PART I: DEMOGRAPHIC VARIABLES OF MOTHERS

1. Age of the mother

a. Up to 25 years

b. 25 to 30 years

c. Above 30 years

2. Height of the mother

a. Up to 150 cm

b. More than 150 cm

3. Type of conception

a. Normal

b. Assisted reproductive technique

4. Parity

a. Primi gravida

b. Multi gravid

5. Any Risk during Pregnancy

a. No Complications

b. Gestational Diabetes Mellitus

c. Pregnancy Induced Hypertension

d. Anemia

e. Other complications

6. Mode of Delivery

a. Normal Vaginal Delivery

b. Assisted Vaginal Delivery

c. LSCS

7. Birth Spacing between the child

a. Less than 2 years

b. More than 2 years

c. Not applicable

PART II: DEMOGRAPHIC VARIABLES OF LBW BABIES

1. Age of the baby

a. First day

b. Second day

c. Third day and more

2. Gender

a. Male

b. Female

3. Birth weight of the baby

a. 1.5 Kg to 2.0 Kg

b. 2.01 Kg to 2.5 Kg

4. Gestational age at birth

a. 37 weeks of gestation

b. 36 weeks of gestation

c. 35 weeks of gestation

d. 34 weeks of gestation

5. Birth order of the child

a. First

b. Second

c. Third and more

6. Mode of sucking

a. Nutritive Sucking

b. Non-Nutritive Sucking

SECTION B

BIO – PHYSIOLOGICAL PARAMETERS

Bio - Physiological Parameters	**Pre Assessment** **Day 1**	**Post Assessment 1** **Day 2**	**Post Assessment 2** **Day 3**
Temperature (F) Heart Rate (per minute) Respiratory Rate (per minute) Oxygen Saturation (%)			

SECTION C

SUCKING RESPONSE

"Modified Early Feeding Skills Assessment Scale"

Feeding Skills	Pre Assessment Day 1			Post Assessment 1 Day 2			Post Assessment 2 Day 3		
	2	1	0	2	1	0	2	1	0
1. Opens mouth promptly when lips are stroked at feeding onsets 2. Tongue descends to receive the nipple at feeding onsets 3. Immediately after the nipple is introduced, infant's sucking is organized, rhythmic and smooth 4. Once Sucking is underway, maintains a smooth, rhythmical pattern of sucking 5. Sucking pressure is steady and strong 6. Able to engage in long sucking bursts 7. Tongue maintains steady contact on the nipple – does not slide off the nipple with sucking creating a clicking sound 8. Swallows are quiet – no gulping or hard swallows 9. Oxygen saturation is stable during sucking 10. Stops sucking to breath									

Feeding Skills	Pre Assessment Day 1			Post Assessment 1 Day 2			Post Assessment 2 Day 3		
	2	1	0	2	1	0	2	1	0
11. When the infant stops sucking to breathe, a series of full breaths with sufficient number and depth is observed 12. Infant stops to breathe before behavioural stress cues are evidence such as eyebrow raise, worried look, movement away from nipple 13. Absence of using accessory breathing muscles such as pulling head back, head bobbing, retracting, tracheal tugging 14. Absence of nasal flaring 15. Heart rate is stable during sucking									

APPENDIX - H

SCORING INTERPRETATION

3 Point Scale:

0 – No Response

1 – Fair Response

2 – Good Response

Maximum Score = 30

SCORING INTERPRETATION:

SCORE	SUCKING RESPONSE
21 – 30	Good Sucking Response
11 – 20	Fair Sucking Response
1 – 10	Poor Sucking Response

Low Birth Weight Babies outside the Nesting

Low Birth Weight Babies inside the Nesting

Providing Nesting to the Low Birth Weight Babies